

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM



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# NCHRP Report 404

## Innovative Practices for Multimodal Transportation Planning for Freight and Passengers

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## Innovative Practices for Multimodal Transportation Planning for Freight and Passengers

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in association with  
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## NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration, U.S. Department of Transportation.

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## FOREWORD

*By Staff  
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This report contains a compilation of successful and innovative multimodal planning practices currently employed in a variety of settings, for both freight and passenger transportation. The report should be of interest to practitioners in state departments of transportation, metropolitan planning organizations, transit agencies, and other transportation planning and decisionmaking organizations. It should also serve as an educational resource on available tools that support effective transportation planning and decisionmaking.

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Since the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), there has been a shift in focus in statewide and metropolitan transportation planning processes from project-oriented modal solutions to a fully integrated multimodal and intermodal mix of freight and passenger solutions. Further, ISTEA and subsequent regulations have required that a comprehensive set of factors be explicitly considered during the development of such transportation plans. Practitioners need information on innovative practices to assist them in responding to the legal and regulatory requirements of ISTEA and in transitioning to a fully integrated and truly multimodal planning process for freight and passenger transportation.

TransManagement, Inc., of Washington, D.C. in association with Matthew A. Coogan and Michael D. Meyer comprised the research team for this project and prepared the final report. This report reflects information obtained from a broad range of sources, including extensive interviews with practitioners throughout the country and the use of an interactive database of documents on innovative multimodal planning activities—organized by major themes established for the research by the project panel. The final report covers selected issues for which innovative practices have been applied. These issues include: agency organization to encourage multimodal planning; application of innovative practices and tools for considering multimodal issues; performance monitoring and evaluation; public involvement in multimodal planning; enhanced rural planning practices; and, practices for consideration of financial constraint in planning and programming. Each chapter includes specific examples of innovation within the subject area and presents a broader summary of selected case studies.

In addition to the final report, this project produced an unpublished project bibliography. This was distributed to the member departments of the American Association of State Highway and Transportation Officials (AASHTO) and can be found on the NCHRP homepage ([www2.nas.edu/trbcrp](http://www2.nas.edu/trbcrp)) on the Internet's World Wide Web as NCHRP Web Document 9.





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Matthew A. Coogan was the principal investigator and Sarah Campbell, President of TransManagement, Inc., was the deputy principal investigator. Other authors of this report are: Dr. Michael Meyer, Professor, Georgia Institute of Technology; Dennis M. Leach, Senior Associate, TransManagement, Inc.; and James I. Fralick, Analyst, TransManagement, Inc.

## CHAPTER 1

# RESEARCH APPROACH AND MAJOR THEMES OF THE PROJECT

Throughout the country, state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) are working to implement the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its mandate to adopt a multimodal, integrated planning process. There is surprisingly little precedent to guide practitioners as they grapple with the new challenges of the law.

NCHRP 8-32(1) is the first in a series of projects examining multimodal practices and evolving techniques appropriate to state DOTs and MPOs and to other transportation agencies. This research provides specific information on advanced or innovative practices now being employed to respond to the mandate. Through 19 case studies, the report documents recent practices at nine DOTs, five MPOs, and one airport involving both passenger and freight transportation.

### RESEARCH APPROACH DEVELOPED IN PHASE ONE

The phase one work program for NCHRP Project 8-32(1) established the form and content of the research contained in this final report. Early in the project, the panel established a fundamental mandate that an exhaustive exploration be undertaken to locate original multimodal planning efforts, from whatever source, for whatever purpose. Phase one was open-ended in nature. It included extensive interviews with practitioners around the country and the creation of an interactive database of documents concerning innovative multimodal planning activities, organized in terms of the chapter themes originally defined by the project panel. This chapter of the final report reviews the results of the phase one work program and presents a summary of the innovative practices that were reviewed in the selection of case studies for further detail. The chapter also summarizes the major themes to be explored in later chapters. Throughout the text, references are made to documents included in the bibliography, which is not published herein.\*

### Project Database

In phase one of this study, the NCHRP 8-32 Project Database was developed, from which seven thematic bibliographies have been created. The database is the result of the assembly of bibliographic references from the following sources:

- The Transportation Research Information Service (TRIS);
- Papers, panels, and presentations accepted for the 74th Annual Meeting of TRB, held in Washington, DC in January 1995;
- Papers and abstracts submitted to a series of TRB conferences since November 1994, including the December 1994 Conference on Best Practices in Intermodal Planning (New Orleans, LA), the April 1995 Conference on Planning Applications (Seattle, WA), and the May 1995 Conference on Metropolitan Transportation Planning (Williamsburg, VA); and
- Documents collected by the project team from federal, state, and regional sources over the last 2 years (including examples of state management systems and federally sponsored research in the area of multimodal and intermodal planning).

The Project Database contains references (in varying levels of detail) to more than 1,000 records concerning subjects associated with multimodal and intermodal transportation planning. From this larger base, the seven subject-specific bibliographies utilize approximately 700 of these project references. The Project Database is the result of a major effort to produce a smaller "browsing library" related to the very focused subareas of multimodal and intermodal planning. Of more than 700 references included, 264 came from TRIS and the rest were selected and inputted by the project team, with the cooperation of the Office of Environment and Planning of the FHWA.

The Project Bibliography created from this database was submitted separately from this report. References in this report to material contained in the Project Bibliography are indicated by bracketed numbers ([Ref. 1-39]), where the first number refers to one of seven categories of references (such

\*The Project Bibliography, "Innovative Practices for Multimodal Planning for Freight and Passengers," is available on the Internet at: <http://www2.nas.edu/trbcrp>.

as public participation or statewide planning) and the second number is the item within that category.

### Geographic Distribution of Database References

Although not all of the references in the Project Database described activity that was specific to a given state, several hundred such references were located. Table 1 shows the geographic distribution of projects reported in the database. An examination of the geographic breakdown helps in understanding the nature of concerns in the separate states. A differentiation can be made between *strategies* such as those used in the management systems (Chapter 4) and *planning and programming* (Chapters 2 and 3). California's high number of entries in the database tends to be explained by its role in *strategies*, where it has the highest number of entries. By contrast, under *planning and programming*, Washington State has the highest number of entries, followed by Florida, Texas, and California.

### Overreaching Criteria for Selection and Evaluation (All Chapters)

In this chapter, the criteria for selection of the sites for further examination are presented for each chapter. In terms of overarching criteria and concepts, the project team has tried to focus on actual procedures being carried out by professionals within the state and MPO planning organizations, rather than on procedures being developed by consultants or by university researchers. The overall concern is for the practicality and cost-effectiveness of the procedures, as defined and evaluated by the local practitioners. Whereas the specific concerns for each chapter are spelled out in the text, the general concerns that guided the project can be summarized as

- Consistency with multimodal challenge;
- Broadness of base of application;
- Examples of a fully integrated multimodal and intermodal mix;
- Extent of integration of both freight and passenger issues;
- Relevance to legal and regulatory requirements; and

- Relevance to transition to fully integrated intermodal and multimodal process.

### Working Definition of Innovative Multimodal Practices

Contained within the phase one work program was the task of deriving a "working definition of innovative planning practices." To do this, it is worthwhile to review several examples of what is *not* meant by the term. An early common reaction to the subject of multimodal planning was the assumption that several modes had to be recommended as an *outcome* of the planning process. In many interviews, the vision was put forward that an outcome with several modes (truck to rail to ship) was an example of multimodal planning, while an outcome of one mode (truck from door to door) was not an example of multimodal planning. For this reason, many practitioners were convinced that such a planning process was simply not relevant in a given state. In several areas, the research team has located significant examples of good practice in multimodal planning that ends up with an outcome of travel by a single mode.

By contrast, proponents of a multimodal transportation center may argue for a facility that maximizes the number of modes available. The argument is made that insufficient attention has been paid to, for example, helicopter landing facilities, and that the rail station must be moved to a location that can accommodate a helicopter pad. Although this facility may be legitimately needed and the outcome may be a very good project, the research team would argue that this is *not* a good example of the multimodal planning process as defined in this research. Perhaps the project could be categorized as an example of facility-based planning, which might be appropriate in the given situation. But, in terms of the concept that is developed in the research, the mere presence of several modes would not, in itself, qualify this as an application of multimodal planning.

Rather, a concept has evolved from the conduct of the phase one research work program that *multimodal planning can most profitably be seen as a series of tools that allows the practitioner to analyze the needs of the person or thing to be transported, giving consideration to the possible roles of candidate modes to serve those needs*. As more fully developed and discussed in Chapter 3, four observa-

**TABLE 1** Distribution of references from the NCHRP project 8-32 interactive database

First Tier of States	California, 40; Washington State, 35; Florida, 35
Second Tier of States	Texas, 27; New York, 21
Third Tier of States	Wisconsin, 18; Ohio, 14; Massachusetts, 12; Pennsylvania, 11; Minnesota, 10; New Jersey, 10; Colorado, 10; Virginia, 10
Fourth Tier of States	All others, below 10

tions can be made about innovative multimodal planning practices:

- Multimodal planning is not an end state; it can best be seen as a set of tools that is applied to solve a locally defined policy issue or problem.
- Multimodal planning is not best seen as the number of separate modal analyses ultimately assembled into a final plan; rather, it is best carried out when “all modes are analyzed simultaneously and interactions among the modes are specifically accounted for.”
- Multimodal planning practices are most needed when applied to planning that is driven by policy needs, rather than the analysis of facilities.

For the analysis to be usable by the policymaker who deals with issues relevant to the rest of society (in terms of economic development or impact on the environment), it is valuable from a methodological point of view to organize the basic data in terms of the characteristics and needs of the person or thing needing the transportation.

### **Results of Phase One: Structure of the Final Report**

After considerable discussion with the project panel, certain alterations were made in the original work program, with a de-emphasis on the ongoing problems concerning the Clean Air Act Amendments (CAAA) and an increase in the amount of time that could be spent obtaining the input of practitioners. The following outline emerged from the end of phase one:

- Chapter 1: Research Approach and Major Themes of the Project
- Chapter 2: Organizing to Promote Multimodal Decisionmaking
- Chapter 3: Innovative Methods in Multimodal Planning and Programming
- Chapter 4: Management Systems and the Development of Measures for the Monitoring of Performance
- Chapter 5: Innovative Methods of Public Involvement
- Chapter 6: Approaches to Multimodal Planning Affecting Rural Areas
- Chapter 7: Approaches to Financial Constraint in Planning and Programming
- Chapter 8: Summary and Conclusions.

## **SELECTION OF CASE STUDIES**

### **Chapter 2: Organizing to Promote Multimodal Decisionmaking**

Chapter 2 examines the importance of organizational structure and institutional relationships at state DOTs and

MPOs in promoting integrated multimodal planning, focusing on particularly innovative agency practices.

### *Criteria Used for Chapter 2*

The following criteria were developed for case study selection, focusing on the organizational and program changes made at the DOT and MPO level as a result of ISTEA. These changes foster a more integrative transportation decision-making process, featuring broad constituent participation and incorporating consideration of all modes. The purposes of these evaluation criteria are to highlight potentially innovative practices and to narrow the candidate case studies to be examined in more detail:

- Innovative state, regional, and/or local partnerships;
- Degree to which the agency (MPO or state DOT) integrates its modal planning and implementation structures;
- In state DOTs, the degree to which modal planning and service delivery is integrated at the field/district office level;
- Innovative organizational and management techniques applied to foster change; and
- Applicability of these structural innovations to their agencies.

### *Projects Reviewed for Chapter 2*

A broad array of candidate case studies was screened using the above evaluation criteria to derive the list of candidate case studies recommended for more detailed research. The TRB 1994 Intermodal Planning Conference (New Orleans) yielded substantial information on potentially innovative multimodal planning practices in Oregon, Washington State, Wisconsin, and Ohio DOTs. Candidate case studies that came out of this research included Wisconsin DOT, Washington State DOT and Puget Sound Council of Governments, Louisiana DOT, Maryland DOT, Minnesota DOT, Caltrans, and the San Francisco Bay Area's Metropolitan Transportation Commission (MTC). In all, more than 20 potential candidate case studies were identified in this phase of the project.

Florida is revealed in the Project Database to be a logical candidate for inclusion in Chapter 2. Florida procedures that “require the DOT to prepare a functional transportation plan in strict conformance with the state policy plan. To do this, physical system studies and planning and multimodal policy planning are required. This dual planning process requires a common conceptual understanding about three major issues: (a) multimodal policy role and its scope, (b) statewide modal systems, and (c) the role of modal transportation in multimodal systems.” [Ref. 1-101] With Florida, the question was not *if* it should be included in the final report, but rather *where*. The project team determined that Florida's long track

record in the area of performance measurement and its innovative use of management systems mandated that it become a central case study for Chapter 5.

Another potential candidate for coverage under Chapter 2 was Ohio. *Access Ohio*, Ohio's Multimodal State Transportation Plan, produced in 1993, signals a departure from past long-range planning efforts in the state in response to ISTEA [Ref. 1-2]. It provides a short- and long-term strategic planning framework for decisionmaking as opposed to being a plan focused on specific transportation projects. Planning coordination and linkage of various modes is the focus of a number of policy directives in this document. The plan also establishes a number of policy directives on institutional relationships and organizational changes and recommends a retooled transportation planning process. However, upon subsequent research, it was determined that many of these proposed changes are just now taking place. As such, it does not provide sufficient time to access the potential effectiveness of these changes.

#### *Case Studies Selected for Chapter 2*

**The Washington State DOT (WSDOT)** features a number of institutional and structural innovations promoting innovative multimodal planning both within and outside of the WSDOT. These innovations have led to changes in the DOT's institutional relationships and structure. WSDOT has made a concerted effort to involve outside agencies in its planning process, including the formation of a broad-based advisory committee to oversee ISTEA implementation. The major outcomes of this process were more inclusive transportation planning practices, a greater emphasis on consideration of all modes of travel in planning, and greater consideration of the state's land use and air quality planning requirements. In 1994, WSDOT was restructured to foster a culture of multimodal planning and management. WSDOT features five modal divisions, representing all major modes. Each division reports to the Secretary of Transportation and acts as an advocate for its mode.

**The Maryland DOT (MdDOT)** has adopted a number of potentially innovative practices that merit its selection as a case study. It has developed extensive expertise for a number of modes and supports a wide range of transportation facilities, including state owned and operated commuter rail and urban transit systems, major port facilities, and a commercial airport. As such, it has established a track record of multimodal planning, programming, and project implementation. The challenge in Maryland is in the development of a more integrated multimodal transportation planning process. The DOT's ongoing corridor planning initiative attempts to foster such integration.

**The Minnesota DOT (MnDOT)** has undertaken a number of organizational changes that meet at least three of the five criteria used for case study selection. First,

MnDOT responded to the special needs of its largest urban region, Minneapolis-St. Paul and its representative MPO, the Metropolitan Council, through the creation of MnDOT's Metro Division to serve as an effective planning, programming, and service delivery partner. MnDOT has developed a strong organizational link between its modal units and the DOT's planning and programming functions. The agency is also currently in the process of decentralizing planning and programming functions to the district offices with these offices taking on more responsibility and accountability.

### **Chapter 3: Innovative Methods in Multimodal Planning and Programming**

Consistent with the overarching criteria noted in Chapter 1, Chapter 3 examines states and regions that have taken their planning process to a certain level of fruition and can provide best case practice data to be meaningful for other areas, considering the adoption of multimodal procedures. In particular, the project scope directed the research team to examine case studies that highlighted the need for cooperation between planning and programming of both the state and regional levels.

#### *Criteria Used for Chapter 3*

In selecting the sites for further examination, the project team has stressed the depth of experience in multimodal planning and programming in looking for examples with the following attributes:

- States with several years of history and experience in the area, whose origins in many cases predate ISTEA by several years;
- Planning processes that have reached substantial milestones, so practitioners have the luxury of hindsight;
- Applications in which the transportation planning process is involved in the effectuation of policy concerns over and above traditional definitions of transportation performance; and
- Sites that will help researchers understand the relationship between the nature of the multimodal planning process and the actual output of programmed projects.

#### *Projects Reviewed for Chapter 3*

A major candidate for further examination in the area of programming is the prioritization process developed at the Oakland-San Francisco MTC. Younger and Murray note that "A multimodal method of project selection for the Surface Transportation Program and Congestion Mitigation and Air Quality Improvement Program was established in spring 1992 that brought all of the relevant players to the table,

strengthened existing plans and programs, and established a new way of doing business on the basis of partnerships and cooperation. The program of projects that resulted from the application of the developed criteria is balanced and multimodal, and it enjoys widespread support in the region.” [Ref. 2-20]

Consistent with the emphasis on the relationship between the planning process and the physical nature of the projects programmed, Florida provides an interesting potential case study. Florida’s Intrastate Highway System program calls for a maximum of 10 lanes, which “includes four physically separated exclusive lanes for high occupancy vehicles and through travel. The policy requires the development of an intermodal system with provision for high speed rail, transit and high occupancy vehicles.” [Ref. 1-17]

In the screening process, the decision was made not to include the San Francisco Bay area in the limited travel budget, largely on the basis that the excellent and precedent setting work in programming underway at the MTC has been visited and documented more than any other process in the country. Given the decision to treat Florida as the primary subject of Chapter 5, the question then focused on the issue of which states have had the deepest experience base in this area.

### *Case Studies Selected for Chapter 3*

**The Wisconsin TransLinks 21** statewide planning process represents a major example of the application of multimodal planning principles, with its emphasis on policy options, rather than modally based preferences. In the development of *TransLinks 21*, four separate planning visions were developed, analyzed, and compared. The options ranged from a conservative scenario based on market choice to a future “shaped largely by environmental and social values.” [Ref. 1-173] This kind of development from policy-oriented images of a state or region’s future represents an excellent example of the kind of multimodal planning envisioned in the creation of the NCHRP 8-32 research projects. The *TransLinks 21* planning process is exemplary in its treatment of freight issues and its explicit incorporation of economic development issues [Refs. 1-202 and 1-173].

The Project Database revealed that multimodal planning procedures were most evident in situations when transportation planning is asked to support a public policy objective, such as state policy on growth management or a state policy on development. Content analysis of the Project Database reveals that the policy subject currently receiving most attention by planners is the linkage between transportation and land use considerations.

**Portland, OR** is the metropolitan area in which concerns about land use considerations have been most extensively integrated with the transportation planning process. A specific purpose of the Portland study is the examination of the extent to which the highly developed program of growth management, and the exceptional interest in alternative

urban form configurations has impacted the programmatic content of the capital budgeting process and of the Transportation Improvement Plan.

**The Eastern Washington Intermodal Transportation Study**, which was presented at TRB’s Best Case Practice conference in New Orleans, is used as a case study in the effectiveness of analyzing the mobility of people and goods in the planning process. In particular, the methods used to understand and illustrate freight flows are examined. This study represents a model for the kind of multimodal trade-off analysis not usually applied to freight issues. “Economic models developed by the study will enable quick-response evaluation of the economic consequences of system changes such as rail line abandonment . . . or expansion of the all weather roadway network.” [Ref. 1-28] The quantitative analysis of the actual trade-off between freight modes (as opposed to a more subjective and qualitative approach) is highly unusual and is being attempted in only the largest and most complex of the new planning efforts, such as California’s Intermodal Transportation Management System (ITMS).

**Puget Sound Regional Council’s Freight and Goods Mobility Study** was undertaken in association with the Freight Mobility Roundtable [Ref. 2-30]. The project, which was designed to “develop a freight and goods database, identifies options for action and select for inclusion in the Metropolitan Transportation Plan Update (MTP) a Freight and Goods Mobility action plan,” can be compared with the rural study in eastern Washington with elements of the Oregon Intermodal Management System being developed through the Port of Portland.

## **Chapter 4: Management Systems and the Development of Measures for the Monitoring of Performance**

During the process of phase one, various revisions of the role of the management systems in the federally required planning process were undertaken. For example, an AASHTO committee on the reauthorization of ISTEA argued that the sanctions for poor performance should be lifted and that the federal role should become less “prescriptive” [Ref. 1-133]. One version of the National Highway System legislation under consideration at that time, and subsequently passed into law, made the management systems optional at the will of the states. The research approach concerning this issue was to proceed with the assigned work program but to locate and emphasize the existence of innovative practices and procedures in the task of *evaluation through locally defined performance measures*, rather than to focus on the details of the Congestion Management System (CMS) or the Intermodal Management System (IMS). Chapter 4 focuses primarily on the state of Florida, which has determined to continue using the concept of performance measurement for its own planning process, rather than for the satisfaction of federally imposed requirements. The emphasis of

the chapter is on existing efforts in the area of *performance evaluation*, which is a central concept behind the management systems.

#### *Criteria Used for Chapter 4*

Given the uncertainties surrounding the new evolution of management systems, the research team was primarily concerned with finding sites with extensive experience over time of performance-based measurement as an element of the management process. The work program selected two states, Florida and Oregon, and one airport, Boston's Logan International Airport, for the study of mature systems of evaluation currently in operation. Notwithstanding the impressive scale of the California effort, there are reasonable arguments to be made that the sheer size of the California project makes it difficult to use it as a teaching example for smaller states seeking to make decisions about cost-effective practices and procedures.

#### *Case Studies Reviewed for Chapter 4*

The California ITMS represents one of the most ambitious attempts in multimodal planning yet undertaken. Its program to forecast and analyze the change in flows between modes for both passenger and freight is designed to allow for the rapid testing of alternative scenarios for possible strategies and actions. The purpose of the ITMS is summarized in the study design dated June 9, 1993 [Ref. 3-192]. In this statewide program, the policy implications of a variety of possible projects, strategies, and actions can be tested at a sketch planning level. At this level of coverage, it is fair to say that the project is unique in its application of multimodal planning principles and procedures.

Another candidate for inclusion in the work program for management systems was the Albany, NY, area's MPO, the Capital District Transportation Committee. Of particular interest to the study of multimodal planning are the efforts in Albany to systematically examine the quality of freight flows, using performance measures that share common terminology with the terms of the CMS [Refs. 2-47 and 3-126].

#### *Case Studies Selected for Chapter 4*

The ongoing program of monitoring and evaluating performance in the **Florida DOT** is used to demonstrate various issues in the application of performance-based planning. A 1993 article by Reid Ewing, "Transportation Service Standards—As If People Matter" observes that "in Florida and Washington State, the search is on for better ways to measure transportation system performance." [Ref. 3-177] Pratt and Lomax, in their 1994 paper, "Performance Measures for Multimodal Transportation

Systems," note that "Florida, a leader in growth management, has already concluded the indiscriminating reliance on roadway Level-of-Service measures, has been driving the land development process in unwanted directions, including urban sprawl, and has revamped its regulations and transportation measurement requirement in hopes of rectifying the problem." [Ref. 3-153]

The IMS, being managed by the Port of Portland in cooperation with the **Oregon DOT**, is used as the case study on the selection of performance measures in the analysis of intermodal freight flows. In the development of management systems to this date, Oregon has provided the most exhaustive review of potential performance measures for both passenger and freight. Oregon's IMS is another example of the application of the selection criterion of long experience in the policy area under analysis. The formation of the Oregon Intermodal Council predates the creation of ISTEA and serves as a forerunner to freight advisory panels now initiated all over the country.

This case study examines the development of a highly innovative metric of performance measurement for use in the monitoring and evaluation of ground access systems to **Logan International Airport in Boston**. The Logan Airport case study, as presented at the TRB's Conference on Intermodalism in New Orleans, provides a classic case study of trip reduction strategies and includes a program for monitoring and feedback that may be a model for the process needed in the implementation of performance-based planning. The presentation, "Trip Reduction Strategies at Logan Airport" by Addante and Ricard, introduces a basic performance measure that is applied in the development of candidate strategies and actions, entitled "ground vehicle trips per air passenger trip." [Ref. 7-3]

### **Chapter 5: Innovative Methods of Public Involvement**

This part of the research program examined the innovative methods for involving the public and modal interests in multimodal planning at the state, regional, and local levels. The chapter focuses on innovative practices used to involve constituents that have not traditionally been represented in the transportation planning process. The passage of ISTEA in 1991 has been the primary catalyst for many of these changes.

#### *Criteria Used for Chapter 5*

The criteria were developed for case study selection that focused on innovative public involvement and outreach techniques employed by DOTs and MPOs as a result of ISTEA or recent state or local policy directives. Effective techniques are likely to broaden the transportation planning and decision-making process and to include con-



stituents that have traditionally been outside of, or under-represented, in that process. The purpose of these evaluation criteria is to narrow the number of candidate case studies to be considered in more detail and to highlight potentially innovative practices, such as

- Breadth of outreach/involvement effort (number of persons and stakeholder groups engaged and extensiveness of outreach approaches);
- Use of innovative communication techniques;
- Variety of structures for public involvement/outreach efforts (informal vs. formal);
- Results of the public outreach process (involvement of new actors, breadth and length of engagement, quality of outreach responses, and degree of change in planning products as a result of the outreach); and
- Degree of applicability to other states and metropolitan areas.

#### *Case Studies Considered for Chapter 5*

A broad array of candidates was screened using this evaluation criteria to derive the list of case studies recommended for more detailed research. The Project Database yielded a wealth of information on public involvement and outreach processes used by DOTs in Oregon, Wisconsin, Maine, and Ohio and by MPOs in St. Louis, Seattle, and San Francisco-Oakland. Initial interviews with other practitioners led the project team to consider DOTs in Maryland, Minnesota, and Delaware and MPOs in Boise, ID; Toledo, OH; and Wilmington, DE.

Many new approaches to engaging the public's interest in transportation were evident from this initial research. For example, the exemplary processes employed in both Wisconsin and Ohio featured numerous meetings around the state and special workshops and forums. Wisconsin's approach to gauging public willingness to finance planned projects is especially instructive to practitioners. In St. Louis, the outreach included high-quality process publications and a wide range of techniques to engage the public. Importantly, this effort spanned the completion of the long-range plan to the implementation of strategies.

All of these potential case studies were screened using the evaluation criteria. The result was more possible cases than could be accommodated. Accordingly, the researchers selected what can be viewed as representative examples of highly innovative public participation activities in Boise, St. Louis, and Wisconsin. Subsequently, it was determined that the Wisconsin *TransLink's* process had been extensively documented by other researchers as well as being included in Chapter 7 of this report. Thus, the choice to include Maine's new citizen-based regional planning process was because of its unique links to citizen initiative and program implementation.

#### *Case Studies Selected for Chapter 5*

In their efforts to develop the long-range transportation plan in the St. Louis area, the **East-West Gateway Coordinating Council** focused on more than just attracting large numbers of citizens. Their goal was to bring in groups that had never participated in the transportation planning process, especially groups they had identified as being transportation disadvantaged from demographic analyses made the previous year. The council originally started their effort with a broad-based Steering Committee, but quickly decided that this was not adequate to reach the groups they were seeking. To this oversight group, the council added three advisory committees on land use, employment, and regional economy, involving several hundred participants. Subsequent to the plans' development, the council has reached out to 60 local agencies and neighborhood groups to form advisory councils to implement community mobility initiatives.

In response to both citizen referendum and ISTEA, **Maine DOT** established eight Regional Transportation Advisory Committees (RTACs) to advise the department on regional transportation and land use needs and goals. RTACs are defined for non-MPO areas. They also were responsible for developing regional transportation plans that were then incorporated with MPO plans into the state plan. The groups are each comprised of 16 to 22 people, who represent a wide range of interests including planning, environment, business, historic preservation, bicycling, and local officials. RTAC members apply to the department to represent one of the defined interests. Although the controversial nature of the referendum caused some difficulty initially, the RTACs and the DOT have continued to work cooperatively to implement strategies proposed in the plan, including a FY'96 initiative on transportation demand management projects.

**The Ada Planning Association (APA)**, the metropolitan planning organization for Ada County, Idaho, provides transportation planning for the small, but rapidly growing, Boise metropolitan region. The APA planning area includes many rural areas as well. In 1994, APA devised a broad-based public outreach effort that used a number of innovative techniques to gauge public opinion about both transportation needs and transportation planning efforts. As in St. Louis, the APA has used innovative methods to involve citizens who have not previously been involved in transportation planning activities. Prior efforts at public involvement were comprehensive but more conventional, and APA is now comparing results to determine best practices in the future.

#### **Chapter 6: Approaches to Multimodal Planning Affecting Rural Areas**

Under ISTEA Congress mandated that policy attention be directed to the needs of rural America. To guide this and other investments in rural areas, the states also are directed to consider "a process that includes consultation with local

elected officials with jurisdiction over transportation.” Since the passage of ISTEA, state DOTs have often encountered difficulty in developing the required consultation processes for rural areas. During a series of outreach meetings in the fall of 1993, the U.S. DOT identified several rural concerns, including the need to improve transportation to health care facilities and to promote greater rural involvement in the state planning and programming processes. This latter issue was deemed of sufficient importance to U.S. DOT that a series of outreach meetings specifically for rural and small urban areas was sponsored by U.S. DOT in 1993 [Ref. 5-11]. A search of the NCHRP 8-32 Project Database also identified continuing interest in the issue and new research into unique rural transportation needs.

### *Criteria Used for Chapter 6*

On the basis of the project objectives, the following criteria were identified for selecting the case study examples of multimodal rural planning:

- The degree to which plans and/or programs for rural areas incorporate multimodal approaches;
- The use of new techniques applicable to rural areas;
- The extent to which public officials of rural towns and counties were involved in needs identification; and
- The applicability to other states of the process or organizational structure used in the example.

### *Cases Considered for Chapter 6*

Using these criteria, the experience of 11 states was considered: Maine, California, Vermont, Colorado, Minnesota, Ohio, Iowa, Texas, South Dakota, Washington, and Virginia. The literature review indicated that each of the DOTs in these states undertook noteworthy efforts to involve rural interests or to develop techniques to meet special rural planning challenges. Among this group, Colorado, Vermont, and Minnesota offered distinctly different approaches to meeting the rural requirements, but each example could have applicability in other states. [Maine also was considered for one of the three case studies, but after several interviews the project team determined that the public involvement aspects of Maine’s experience in implementing new state multimodal policy were highly exemplary; therefore, Maine was included in Chapter 5.]

The choice of these three examples was strongly influenced by early research, which revealed a high degree of interest among state and local officials in both the type of organizational approach used to implement statewide planning and in successful methods of involving local officials in rural areas. In each of the three cases, the state elected to meet the rural planning requirements by assigning substate institutions increased responsibility for planning and/or pro-

gramming throughout the state. For example, in Vermont existing regional planning commissions (RPCs) were given new responsibilities for transportation planning and programming and also given new funding support for these activities. Colorado DOT (CDOT), directed by state legislation, worked with local and county officials to define new planning regions for transportation and built their state plan from the local level up. While in Minnesota, the DOT established coordinating committees involving existing state, local, and regional agencies, called area transportation partnerships (ATPs), throughout the state to develop the annual improvement program.

Although each of the cases deals with statewide approaches to planning and programming, rural interests were incorporated in each, and special efforts to address uniquely rural issues were made in the process. By looking at statewide approaches involving rural areas, the project team was able to identify techniques used to address a central concern of transportation officials: how to ensure equity and balance between rural and urban areas when allocating resources through statewide plans and improvement programs.

### *Case Studies Selected for Chapter 6*

**Colorado** state law enacted just prior to passage of ISTEA required the DOT to engage in a statewide planning process involving the development of regional plans by local and county officials. Through extensive consultation with all counties and municipalities in the state, CDOT staff established 15 transportation planning regions (TPRs) and provided funding and staff support to RPCs in each of the TPRs. A unique feature of the Colorado process is the formation of an umbrella group with representation from each commission. This group was extremely valuable to the state in developing the state plan and improvement programs based on the regional efforts, proving effective in striking a balance between urban and rural interests. This process added greatly to the credibility of the effort.

Like Colorado, the **Vermont Agency of Transportation (VAOT)** went to considerable lengths to ensure local support for the development of regional transportation plans and for the use of the existing RPCs, which had originally been established by the state to implement Vermont’s land use law. The combination of responsibility for both land use and transportation in any one agency is unusual in any setting but especially so in rural areas. Although the RPC role is unique to Vermont, there are many aspects of the planning process that are applicable to other states. The RPC process has greatly improved the awareness of local officials of the complexity of project development and has resulted in a planning process incorporating multimodal considerations in many cases.

In 1992, the **Minnesota Department of Transportation (MnDOT)** embarked on its effort to engage local officials

in the state programming process as part of its effort to decentralize planning and programming. To accomplish this, the department created new coordinating bodies with representatives of state transportation and local and regional planning agencies. The ATPs were staffed by MnDOT district offices and given the role of developing regional improvement programs. The ATP process offers useful lessons to other states on issues such as planning area boundaries, district staff roles, and resolution of rural and urban interests.

## **Chapter 7: Approaches to Financial Constraint in Planning and Programming**

Under ISTEA, financial planning plays an important role in policymaking, planning, and project selection. MPO plans and transportation improvement programs (TIPs) must specify “likely” and “reasonable” sources of funding. Potential funding mechanisms, such as proposed tax increases or bonds that still must go before voters, cannot be considered. For the most part, dealing with financial constraint is difficult because sources of funding are often uncertain and participants have different levels of understanding of the potential financing techniques. At the state DOT level, ISTEA requires only financial constraint for the improvement program. Through research, several techniques were identified to address the financial constraint issue and the number of states and MPOs that have successfully brought financial considerations into the overall planning process.

### *Criteria Used for Chapter 7*

Given the high degree of interest among practitioners in the best ways to address the new financial constraint requirements, a number of states and MPOs were reviewed for effective approaches. In narrowing down the possible candidates for further research, the following criteria were applied:

- Change to the planning process in response to financial constraint;
- Innovative financing techniques to supplement funding;
- Innovative techniques used to bring plans and programs in line with available and reasonably anticipated funds;
- Effect of unrestricted sources of state or local funds on multimodal planning; and
- Lessons learned that would be applicable to other states and/or regions.

### *Case Studies Considered for Chapter 7*

By applying the criteria described above, a number of examples were identified for possible case studies. Maryland and Wisconsin are two states among several that have

created Intermodal Transportation Funds (ITF). These funds have allowed both state and local planning groups to make financing decisions with greater flexibility. Focusing on one of these two states would highlight the potential effects of unrestricted funds on plans and programs. Also Wisconsin tied the public involvement process to long-range plan financing in a way that generated support for new investments.

In response to ISTEA, the MnDOT defined a process for regional planning organizations to use to evaluate investment decisions. Both Oregon and Washington are widely recognized as having dealt effectively with financial constraint. Oregon has worked closely with its five MPOs to develop a fair allocation of resources for the 20-year plan horizon and for individual TIPs. Washington State has developed several processes for allocating funds on a regional basis. Pittsburgh’s Southwestern Pennsylvania Regional Planning Commission (SPRPC) has created a Transportation Finance Committee, which is responsible for ensuring that SPRPC’s plan complies with ISTEA’s financial constraints [Ref. 6-19].

The research team had initially looked for examples of innovative financing approaches that resulted in more funding for multimodal activities. However, the review of experiences reported across the country led the research team to focus attention on the impact that financial constraint has had on planning processes. Given this new focus, Minnesota, Wisconsin, and Pittsburgh were chosen as the primary research cases.

### *Case Studies Selected for Chapter 7*

The case study on the **Southeastern Pennsylvania Regional Planning Commission** sheds light on how MPOs deal with financial constraint in both plans and programs. The MPO’s use of two technical committees to provide planning and programming recommendations to a board of more than 40 representatives illustrates the complications that can develop when there are numerous participants representing different regional and modal interests. This example illustrates how pressures resulting from financial constraint are resolved at the local level. It is also one of many examples of applying financial constraint late in the process to minimize the impact on the free flow of ideas.

**MnDOT** created ATPs along rough district boundaries to bring more participants into the planning and programming process. MnDOT also attempted to restructure internally to encourage nonhighway planning considerations. In the face of efforts to promote multimodal planning, Minnesota is similar to many states in that it struggles to adequately fund maintenance and preservation of its existing transportation infrastructure, and thus funding for new activities is limited. Minnesota provides a good example of the extent to which planning activities are affected by financial constraint.

The **Wisconsin DOT** case study highlights the range of opportunities that exist when applying financial constraint to plans and programs if a comprehensive transportation fund exists. Wisconsin has no constitutional restrictions with regard to the allocation of transportation revenue, and the research team felt that this example would provide an

interesting contrast to other states where categorical funding restriction exists. Wisconsin also used the financial constraint requirements as an opportunity to learn how citizens would support funding for projects included in the plan before the issue of limited resources was brought into focus.

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## CHAPTER 2

# ORGANIZING TO PROMOTE MULTIMODAL DECISIONMAKING

## INTRODUCTION

The passage of ISTEA in 1991 caused state DOTs and MPOs to play new or expanded roles in multimodal transportation planning and programming (23 USC 134 and 135). In a number of states, the new federal requirement was coupled with changes brought about by state legislatures and local governments to expand participation in the transportation planning process and to consider more factors in making transportation decisions. If DOTs and MPOs are to meet these challenges, it may require changes in organizational culture and structure to support multimodal planning and programming processes. Such changes are difficult to make and often take a number of years to implement.

Most DOTs were created primarily to fund, design, and construct the national and state highway systems. Other modes such as transit, commuter and intercity rail, rail freight, airports, and ports were either of secondary importance or not within the agency's purview. For agencies to effectively respond to a new transportation and community development paradigm requires cultural, organizational, and program changes.

This chapter examines the importance of organizational structure and institutional relationships at state DOTs and MPOs in promoting integrated multimodal planning. The focus is on particularly innovative practices at the state and regional levels. More specifically, this research seeks to identify the following:

- Key drivers or agents of change affecting selected DOT and MPO case studies;
- Major areas of change in agencies that support multimodal planning and programming; and
- Difficulties encountered in fostering effective change.

As expected, many of these efforts are still "in-process" because of the long time frames necessary to make substantive cultural, organizational, and process changes. This chapter is organized into three broad areas: general findings from the research, a more detailed description of individual case studies, and a section on general lessons learned and the implications for further research in this area.

## OBSERVATIONS

The process for identifying case studies for detailed research on organizational change is described in Chapter 1. The criteria used to select case studies for more detailed study include the following: the degree of organizational change resulting from ISTEA; the degree to which the agency integrated its modal planning and implementation structures; the degree to which modal planning and service delivery is integrated at the field/district office level; innovative organizational and management techniques used to foster change; innovative state, regional, and/or local partnerships; and the applicability of these innovations to other agencies.

Using these criteria, Minnesota DOT (MnDOT), Washington State DOT (WSDOT), and Maryland DOT (MdDOT) were chosen for in-depth case study research. Upon selection of agency case studies, a more detailed case research plan was included to objectively document agency change. This more detailed research included extensive on-site interviews with agency staff as well as interviews with other agencies and interest groups that would be affected by changes under study. For example, the Minnesota case study included interviews with three MPOs and a transit provider. The plan also included a review of relevant documents such as organizational charts, reorganization plans, and multimodal state transportation plans. This research approach has yielded a wealth of agency information concerning organizational and process efforts to move agencies toward effective multimodal planning and programming.

In reviewing states that have attempted organizational and process changes to promote multimodal decisionmaking, it appears that the more innovative DOTs have a history of policy-based planning.

The agents of change have come from a number of arenas, which vary in the case studies evaluated. In Washington State, the state's Transportation Commission, the state legislature, the Puget Sound Regional Council, and senior DOT staff appear to all have played a role in orchestrating change in the DOT. In Maryland, the catalyst for change appears to have emerged both from within the senior levels of DOT and from supportive governors and the legislature. In Minnesota

and Colorado (discussed in Chapter 6), senior DOT staff appear to be the primary agents for change.

In all of these cases, organizational policy shifts appear to have been in play prior to the passage of ISTEA. ISTEA programs tended to support or bolster state DOT efforts to effect change and to promote multimodal decisionmaking. Further, these organizational and process changes are ongoing, and the ultimate success of these changes cannot be fully assessed at this time.

## THEMES

The following four organizational themes have emerged from the case examples in this chapter and have a correlation with effective multimodal planning for freight and passengers.

**DOTs address urban needs through partnerships with large MPOs.** The push for multimodal decisionmaking has often originated in large urban areas facing significant mobility and accessibility issues. These issues emerge through the local and MPO planning efforts. State DOTs have developed varying organizational responses to the needs of their large urban areas. Both Minnesota and Washington State have responded by creating units within the DOT that can function as a partner in regional transportation decisionmaking in major urban areas.

**Development of modal advocacy units can be a key step toward organizational change to promote multimodalism in state DOTs.** Many state DOTs were created to develop and maintain the interstate and state highway network with a lesser policy or regulatory role in other transportation modes. State DOTs that have attempted to move from this traditional orientation to a multimodal orientation have developed and nurtured modal expertise and advocacy in their organizations. The three examples illustrate DOTs that differ in the strength of, and relationship between, modal units.

**Restructuring DOT district offices promotes multimodal planning and programming.** Much of the focus of DOT restructuring has been on improving decision-making processes in the central office of state DOTs. This restructuring has been driven by the state legislatures and legislative policy, federal initiatives such as ISTEA, and leadership in the DOT. However, the delivery of DOT services, day-to-day decisionmaking on projects, and the bulk of DOT staff reside in district or regional offices. The question is whether the district offices are also restructuring to broaden decisionmaking and to promote a more mode-neutral process for project selection and development.

**State transportation funding restrictions affect multimodal planning and programming structure and outcomes.** From the investigation, it appears that the structure of a state's transportation funding programs is a strong predictor of the effectiveness of organizational changes made to promote multimodal decisionmaking. If a state DOT has

restructured to promote more mode-neutral planning but is legislatively restricted to funding highway projects and local transportation aid programs only, the organizational changes will have a limited impact on investment decisions. Likewise, if a state has a flexible transportation funding program but does not have an organizational structure and culture that promotes multimodal decisionmaking, the impact of flexible funding is likely to be limited.

## CASE STUDIES

### Case Study A: Minnesota DOT

#### *Background*

As in other states, Minnesota created a DOT from separate state transportation offices in 1977. Units such as aeronautics, rail, and waterways were merged with highways. The modal units, other than highways, were small in size and located in the central office. The highway construction and maintenance functions were located in district offices, with highway planning and programming being centrally located. This general structure remained in place through most of the 1980s until internal DOT leadership, coupled with changing federal regulations, began to change the DOT's mission, culture, organization, and planning and programming processes.

#### *Agents for Change*

The primary agents promoting change at MnDOT were the leadership and senior staff of the DOT supported by the federal legislative backdrop of ISTEA. According to internal and external interviews, MnDOT was in the process of incrementally changing the way it did business, recognizing that its mandate as primarily a highway building agency was coming to a close. For example, the formation of the DOT's Intermodal Council, which pulled together senior staff across modes to discuss DOT policy issues, was initiated prior to ISTEA.

The passage of the CAAA in 1990, together with the passage of ISTEA and the appointment of a new agency commissioner in 1991, greatly sped up the process for change (Minneapolis-St. Paul is designated as a nonattainment area). The internal orientation of this agency's reorganization initiatives sets this case apart from both Washington State and Maryland, where there was a considerable push for change from state and local officials and interest groups.

#### *DOT/MPO Partnership Formed Through District Office Restructuring*

MnDOT created the Metro Division from two competing DOT district offices that represented the Minneapolis-St. Paul region. The purpose of this office is to oversee plan-

ning, programming, design, and construction in the region in partnership with the Metropolitan Council, the designated MPO for the region. Planning and programming staff were transferred from the central office to this new division office. This office has also acquired expertise in other modes, particularly in the area of transit.

Coordination between the MPO's long-range plan and the state plan, as well as TIP, takes place through the Metro Division. According to both DOT and MPO staff, these structural changes have greatly improved transportation decision-making processes for the metropolitan region.

### *Modal Advocacy Units*

Linkage between modal advocacy units and the DOT's planning/programming functions has expanded planning and programming considerations. In MnDOT, modal units for transit, railways, and waterways (one unit), aeronautics, and highways have existed in some form since the DOT's creation in the late 1970s. In 1989, these units were grouped under a newly created Division of Program Management. In 1992, the modal units reported to a newly created Division of Transportation Research and Investment Management. This change brought DOT's long-range planning, investment decisionmaking, and modal interests into one division. The Operations Division continued to oversee the district offices (except for Metro, which was elevated to division status), maintenance, traffic engineering, electronic communications, and the quality assurance program.

According to DOT staff, the relocation of planning and programming policy from operations, with its strong highway orientation, to a multimodal program division has promoted multimodal decisionmaking in the DOT central office. However, restrictions of funding by mode in both state and federal funding programs have limited the implementation of multimodal DOT programs.

### *Agency Decentralization*

MnDOT is in the process of decentralizing its operations to district offices, pushing multimodal planning and programming responsibilities to those units. For the first time, district offices are being held responsible and accountable for program budgets. To assist in this transition, the DOT has assigned a Transportation Planning Coordinator to each district office on permanent assignment from the central office. In addition, the districts have begun to hire regional planners to supplement their highway and traffic engineering staff.

However, outside of the Metro Division, which covers the Minneapolis-St. Paul region, the district offices generally do not possess staff experience in multimodal decisionmaking. DOT modal expertise in aviation, transit, rail, and waterways is still centralized (although two members of the transit staff serve in district offices on a part-time basis). It is

unclear as to what degree these functions will be decentralized to the district offices. Given the limited staff in each of the centralized modal units, decentralization could eliminate a critical mass of modal expertise in the DOT necessary for effective decisionmaking.

In addition, there is also a question as to whether the cultural change in the central office, which promotes multimodal decisionmaking, has in fact also taken hold in the district offices. On the basis of interviews with DOT staff and smaller MPOs, the outcome is not clear.

### *Funding Structure Limits Planning/Programming Process Outcomes*

In Minnesota, the source of funds for the state's transportation programs appears to limit multimodal decisionmaking. State gas tax and motor vehicle excise taxes are legislatively dedicated to the state's trunk highway system and for aid to counties and local jurisdictions for arterial and street programs (1). Other modes receive state funds from the general fund based on a biannual legislative appropriation. These funds have remained relatively stable in recent years. The Twin Cities region also has a small real estate tax increment approved to fund transit operations. Although the agency has made considerable strides to become more multimodal in its decision-making processes, outcomes appear to be inhibited by its funding program structure, as described by senior DOT managers.

One example of funding program restrictions working at cross purposes with DOT plans and programs is support for transit service in the Twin Cities region. DOT's Metro Division, in partnership with Metro Council and MTC (the local transit provider), participated in the Team Transit Project to enhance transit service in the region through the development of exclusive bus lanes and bus shoulders, bus ramp metering bypasses, etc. All participants felt that this was a successful program. However, because of constraints on transit operating funding at the time of these interviews in 1995 (which comes from an increment on regional property taxes and general fund appropriations), MTC was in the process of reducing its bus fleet, cutting service, and raising fares, even as transit supportive facilities were being programmed.

### *Agency Difficulties Encountered in Promoting Organizational Changes*

MnDOT has faced a number of difficulties in its efforts to become more effective in multimodal planning and programming. First, the agency was broadening its decision-making process (to include more interests) and expanding modal considerations in a period of stagnant transportation funding and a bloated pipeline of projects, which were predominantly highways. These circumstances have under-

mined the outcomes of the planning and programming process. The lack of modal and project flexibility in the use of the gas and motor vehicle excise tax also severely limits planning and programming outcomes.

An additional difficulty encountered was the ability to make lasting changes at the district level where most of the DOT staff resides. Organizational and cultural changes promoting multimodal planning and programming appear to have taken hold in the central office. However, senior DOT staff expressed concern over the understandability of their initiatives to the larger staff and whether they would ultimately get a buy-in on this new direction for the agency.

## **Case Study B: Washington State DOT**

### *Background*

The State Transportation Commission, founded in 1971, is a seven-member board appointed by the governor. The commission is charged with recommending transportation policies to the state legislature, appointing the DOT secretary, and guiding the state's transportation program. The DOT was created in 1976, and toll facilities and the Washington State Ferry System were put under DOT control in 1977. The DOT has an ownership and operational stake in the state's highway system and the ferry system (although these two modal activities are planned for and managed separately). The major changes that have taken place at the DOT are the development of an interest and expertise in other modes, such as transit, intercity rail, bicycle and pedestrian systems, and the development of integrated planning and program processes that address transportation needs across modes.

### *Agents for Change*

The Washington State Legislature has played an important role in fostering change in the transportation planning and programming process through its environmental, development, and transportation legislation. Concerning the environment, the legislature has passed the State Environmental Policy Act, the State Clean Air Act, and Energy Policy Act (2).

In 1990, the legislature passed the Growth Management Act. The legislature concluded that while the transportation system in Washington is owned and operated by numerous jurisdictions, it should function as one coordinated system. Transportation planning, at all jurisdictional levels, should be coordinated with local comprehensive plans; this act required such coordination. In addition, the legislature concluded that the state and local jurisdictions need to cooperate to achieve both statewide and local transportation goals. Toward this end, the legislature authorized the formation of Regional Transportation Planning Organizations (RTPOs) throughout the state, whose purpose is to plan the development and use

of regional transportation facilities and services. On another front, the legislature has been actively promoting change through the appropriation process by specifying transportation program expenditures by program and mode.

In 1993, the legislature passed statewide transportation planning legislation outlining WSDOT's role and providing specific guidance on statewide transportation planning. This act requires WSDOT to prepare a transportation policy plan, a statewide multimodal transportation plan, and mode specific plans. This legislation also established state interest in aviation, marine ports, freight rail, intercity rail, bicycle transportation, pedestrian walkways, and public transportation.

The Puget Sound Regional Council (PSRC) and its members were another agent for change. In the late 1980s, PSRC led the region in an exploration of alternative visions for the future of the region focusing on development/land use, environmental quality, and open space preservation. The result of this process was Vision 2020, a plan for the region that would later provide the basis for the MTP produced in 1995. This effort had a substantial influence on the DOT and transportation planning and programming because over 56 percent of the state's population resides in the Puget Sound region.

The State Transportation Commission and the leadership of the DOT was another catalyst for change. The commission, which is charged with transportation policy oversight, strongly supported multimodal planning and programming and made a commitment to do statewide multimodal planning in the early 1980s. In 1988, the DOT began to form partnerships with MPOs to undertake local planning. This was followed by an agency reorganization in 1993. Each step moved the agency toward the goal of community-based multimodal transportation planning and programming.

ISTEA and the CAAA were very supportive of these other initiatives but do not appear to be the dominant drivers of change in Washington State.

### *MPO/DOT Partnership Fostered Through Creation of Regional Planning Office*

WSDOT created the Office of Urban Mobility in 1992 to take on DOT's responsibility for planning in the Puget Sound region in partnership with PSRC. This office is responsible for coordinating the efforts of DOT's modal offices with PSRC's long-range transportation plan and TIP. This office features multimodal planning capabilities with a staff of 18.

The office appears to have solved several issues in the area of DOT/MPO coordination, such as:

- District office boundaries do not coincide with MPO boundaries (creating coordination problems).
- Almost 75 percent of the DOT's transportation program is in the Puget Sound region. To effectively manage the



work program, the region's program needs to be split between districts.

- The Puget Sound region is unique in the state given the region's size, population, economic activity, and environmental issues (water and air quality).

The Urban Mobility Office allows the DOT to respond effectively to these issues. According to PSRC and DOT staff, this structural change has improved coordination and has led to a more multimodal transportation decision-making approach.

#### *Creation of Modal Advocacy Units Enhances Agency Capabilities*

In Washington State, the DOT is responsible for the maintenance and operation of the state highway system, the ferry system, and small airports. The state DOT also has an interest in ports, rail freight, passenger rail, and transit. In recognition of the increasing importance of these state interests, the Public Transportation and Rail Division and the Freight Mobility and Economic Partnerships Division were created in 1994 to enhance the position of these other modes in the department's decision-making structure. These new units were charged with a role of modal advocacy and education within the DOT as well as more traditional modal planning and technical support. Subsequent to this organizational change, the state's role and funding for these modes have expanded. One of the DOT's stated achievements that may be associated with this change was the expansion of Washington State's intercity rail program, which included rail service area expansion, increased frequencies, and an aggressive station renovation program, according to WSDOT's Secretary of Transportation.

#### *Agency Restructuring Changes the Role of the Regional Office*

At the DOT, the role of regional offices has expanded over the last 4 years. Currently, planning is split between the regional offices and the central office. Each regional office is required to produce a multimodal regional transportation plan in coordination with local MPOs and RTPOs. In the case of the Olympic, WA region, the office has added planning staff capabilities in transit and works closely with the centralized DOT Aviation, Ferries, and Rail Divisions. The capabilities of the regional offices vary across the state. Regional offices associated with large urban centers tend to have progressed further in respect to multimodal planning and programming capabilities, according to the District Planning Director for the Olympic region office. The major changes that have taken place in regional offices are the addition of planning capabilities and transit expertise. Prior to 1991, no planning was done

at the regional level, and work was oriented toward highway construction/expansion and maintenance.

#### *Fragmented State Transportation Funding Structure Limits Major Agency Initiatives*

In Washington State, the state legislature has created a complex program funding structure for transportation based on fuel taxes, vehicle excise taxes, and a locally imposed sales tax increment. This structure has specified percentages of funding from each source to be dedicated to numerous state, county, and local programs. For example, for FY'96, it was estimated that over \$652 million in revenues would be available for disbursement. Of that amount, 20 percent is for the county aid program, 10 percent is for the city aid program, 2.4 percent is for rural aid, 4.6 percent is for the ferry system, and 12.9 percent is for a variety of transportation improvement board accounts (competitive local government programs with some set-asides) (3). The state DOT receives 46 percent of the available gas tax revenue for its programs. A similar picture emerges with the use of state motor excise taxes, which are split between the DOT, local transit aid, local road aid programs, and non-transportation uses (4).

The resulting highly fragmented program structure appears to limit flexibility for the state and its constituents to make large mode-neutral strategic investments in transportation and, thus, works against true multimodal decision-making. This is because the overall funding available for transportation in the state is divided up into many small "pots" with a significant level of local participation in how that money gets spent. For example, under the current funding framework, the state DOT would find it difficult to fund a large project that combined several modes, such as the I-66/Metrorail Corridor Project in Northern Virginia, which incorporated the development of a heavy rail facility, a high-occupancy vehicle (HOV) highway, and bike and pedestrian facilities.

However, even in this context, substantial state funds have been dedicated to funding nonhighway modes, including the state-operated ferry system, locally operated transit service, and intercity rail. In addition, modal flexibility has recently been added to specific program accounts managed by the state's Transportation Improvement Board.

#### *Agency Difficulties Encountered in Promoting Organizational Changes*

Two difficulties emerge in WSDOT's efforts to become a multimodal transportation agency. The first deals with the pace of change and the ability of the organization (the DOT) and its constituents to deal with that change. The legislature has taken a very active role in legislating change in the DOT. From interviews with agency staff and external interests, the

rapid pace of change has led to confusion concerning agency roles and responsibilities. For example, both the DOT regional offices and the RTPOs are to prepare long-range transportation plans; however, the process for coordination has not been worked out in many cases. The second difficulty is that over 2 years after legislation required the DOT to prepare mode specific plans, some modal units are still struggling to complete these plans. In several cases, MPOs were unclear about the DOT's organizational structure and decision-making processes.

### **Case Study C: Maryland DOT**

#### *Background*

The MdDOT was created in the early 1970s from the merger of separate modal departments including ports, highways, transit, and airports. Prior to the merger, the modal departments had their own organizational structures and funding sources. The merger, which was modeled on the development of U.S. DOT, created five strong modal administrations and a quasi-independent transportation authority (5). Unlike other state DOTs, MdDOT is the owner and operator of much of the state's highway, transit, airport, and port facilities. However, in this new structure, the State Highway Administration was the dominant unit, with most of the agency's staff and program. It was only in the 1980s that other modal administrations expanded their program scopes.

#### *Agents for Change*

The ISTEA of 1991 and the CAAA of 1990 supported MdDOT's emerging objectives for transportation planning and development to focus more clearly on mobility as the ultimate goal as opposed to simply building roads, railways, and runways (6).

In addition to changes in federal regulations, there was considerable interest in change already underway in the state. Concern by state and local officials and the public over the quality of Maryland's environment and the state's long-term economic viability gave rise to the Maryland Economic Growth, Resource Protection, and Planning Act of 1992. The primary actors in the creation of this legislation were the governor and the state legislature. This act focused on seven visions for Maryland regarding development, land use, and environmental protection (6). This act has caused the DOT to more thoughtfully consider the implications of transportation investments on land use development and the environment. It also encouraged multimodal planning and programming responses in the state's more congested corridors. Within the DOT, the Commuter Assistance Study, launched

in 1989, focused on improving the ability to move people, not just cars, in the Washington-Baltimore region.

#### *Organizational Structure Features Strong Modal Advocacy Units*

Each modal administration had operational as well as planning responsibilities, and each retained a high degree of autonomy. For example, the Mass Transit Administration owns and operates transit systems in the state including extensive commuter rail service. The Ports Administration runs the Port of Baltimore. The Aviation Administration operates Baltimore-Washington International Airport. Each unit draws upon the resources of the flexible transportation trust fund. Modal administrators report directly to the Secretary of Transportation. From its inception, MdDOT has had a history of strong modal units.

MdDOT has a highly centralized organizational structure with staff resources concentrated in the statewide modal administrations. The district offices are responsible for maintenance, construction, and traffic engineering. Planning and programming are done centrally by the modal administrations.

#### *Multimodal Corridor Planning Teams Make Headway*

The challenge for MdDOT is in the development of multimodal decision-making processes (across modes). The DOT's recent corridor planning initiative, which pulls together planners from each of the relevant modal units to develop corridor plans, is a move toward multimodal decisionmaking in both programming and planning, as discussed with MdDOT's Director of the Office of Planning and Preliminary Engineering. In the Washington-Baltimore region, a major DOT initiative is the ongoing Commuter Services Assistance Program, a multiyear effort to improve accessibility and modal linkages in a zone stretching from the City of Baltimore to Washington. Multidisciplinary teams have been formed for each study corridor in this program. Teams may consist of staff from the Secretary's office, representatives from the State Highway Administration, the Mass Transit Administration, the Washington Area Metropolitan Transit Authority, and the MPO. These multidisciplinary teams continue to operate through the life of the program. MdDOT has formed similar multidisciplinary and multi-agency teams for other projects in the state, including the ongoing Route 301 Corridor Study.

Unlike other states that have focused on improving the multimodal planning and programming process both internal to the DOT and involving external stakeholders (with less emphasis on modal outcomes), MdDOT has given more

emphasis to multimodal project outcomes working in concert with county governments. In a recent MdDOT publication highlighting Maryland's recent contributions to an improved national highway system, over half of the 14 projects listed were multimodal and intermodal in nature. The Greenbelt Metro and MARC Commuter Rail Station project in Prince George's County is typical. It features a Metrorail station, a MARC commuter rail station, and a 1,500-car "park & ride" lot with exclusive transit station access ramps to and from the I-495 Capital Beltway. This one project features four modes: bus, commuter rail, heavy rail, and automobile. Other projects include multimodal transportation service to the state's primary airport, Baltimore-Washington International Airport, and multimodal and intermodal services at the Port of Baltimore.

#### *Flexible Transportation Trust Fund Supports Multimodal Objectives*

Maryland has a truly flexible transportation trust fund that can be used to fund all modes. The DOT is required to allocate a certain percentage of the motor fuel tax and motor vehicle tax revenue to the city of Baltimore and other counties as transportation aid (as it does with some other states). For revenue dedicated to the trust fund, the only modal restriction on funding is that state-operated transit services must recover at least 50 percent of operating costs from fares (7). The Secretary of Transportation also chairs the Maryland Transportation Authority, which operates the state's toll facilities. Although the authority maintains a separate transportation fund, toll revenues can be used to fund capital projects in other modes. These funds have been used to fund port improvements and the development of an international wing at Baltimore-Washington International Airport. A loan from this fund also provided funding for DOT's light rail construction in Baltimore. This funding structure appears to promote more strategic allocation of resources to meet the state's transportation needs across modes. Flexible funding has permitted the state to sponsor substantial improvements to its primary port, airport, and transit facilities, which has led to substantial year-to-year changes in modal funding allocation (7).

#### *Agency Difficulties Encountered in Promoting Organizational Changes*

In MdDOT, the primary difficulty in the promotion of multimodal planning and programming is in changing organizational culture. Each modal administration has had its own staff, autonomous organizational structure, and program since the DOT's creation in the 1970s. Coordinating the planning and programming processes of these autonomous

units is a challenge. Factors that have eased the process of integration are Maryland's flexible transportation fund and the substantial level of funding provided for all modes of transportation at the state level.

### **LESSONS LEARNED**

There are multiple levers for change as state DOTs and MPOs promote multimodal planning and programming in the cases analyzed. These include state legislature and governor-backed policy initiatives, policy initiatives from state-appointed transportation commissions, senior DOT staff leadership initiatives, and pressure for change from large and well-established regional councils, such as the Metropolitan Council in Minnesota and the PSRC in Washington State. In all the cases studied, federal legislation (ISTEA and the CAAA) was not the sole lever of change to move the agency toward multimodal planning and programming. Instead, these federal initiatives were supportive of new or ongoing state policy efforts.

The shift toward a multimodal planning and programming policy orientation appears to have progressed furthest in the large metropolitan areas. In the cases analyzed, state DOTs and MPOs have formed innovative partnerships to solve complex regional transportation problems. Less change appears to have taken hold in smaller metropolitan areas where congestion and air quality issues are not at the forefront of transportation concerns. This point was confirmed by interviews with MPOs, DOT district offices, and interest groups outside of the large urban centers.

In the agency case studies evaluated, the development of modal expertise and advocacy (in a variety of modes including transit, freight rail, intercity rail, ports, in addition to automobile) within the DOT appears to be an important step toward multimodal planning and programming.

The real challenge for DOTs is in restructuring and reorienting district offices to promote multimodal planning and programming. In all agencies studied, organizational and cultural changes appear to have taken hold in DOT central offices; however, the bulk of most DOT work forces is located at the district where projects are often programmed and implemented. Additional research should be conducted on effective techniques for integrating DOT district offices into the process of organizational and cultural changes to promote multimodal planning and programming. Colorado DOT appears to have been particularly effective in involving the district offices in its process of changing DOT policies. DOT leadership required that senior district staff be involved early and throughout the state's first comprehensive long-range plan development, which involved substantial input from local elected officials and the public (discussed in Chapter 6), as well as through the resulting multimodal transportation program implementation. In this way, senior dis-

trict staff developed an ownership stake in the DOT's new direction.

Finally, program finance also appears to be important in the promotion of multimodal planning and programming. Flexible transportation trust funds appear to be the best mechanism for allowing DOTs and MPOs to arrive at an appropriate mix of modal solutions to solve mobility and accessibility issues on a region-by-region basis. For example, the modal response for moving freight in eastern Washington State may be very different from the modal response for moving freight in the Puget Sound region. Many states face limitations on the use of transportation-related taxes and

user fees that require highway-related expenditures. Other modes are funded by general legislative appropriation. In this case, the DOTs and MPOs need to become effective advocates for funding of their multimodal planning and programming outcomes. Another less holistic solution is for DOTs to stretch the envelope of what can be funded by restricted highway taxes and user fees. In both Washington State and Minnesota, such efforts appear to be ongoing. Because the structure of state program funding appears to be such an important factor in the ultimate outcomes of multimodal planning and programming processes that are now being established, more in-depth research should be undertaken in this area.

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## CHAPTER 3

# INNOVATIVE METHODS IN MULTIMODAL PLANNING AND PROGRAMMING

### INTRODUCTION

Chapter 2 examined alternative institutional and management structures designed to support multimodal planning. This chapter examines various innovative practices in multimodal planning for freight and passengers, with an exploration of the relationship between these innovative practices to the projects and policies actually selected as a result of the revised planning efforts.

### OBSERVATIONS

Throughout this study, the project team found that many of the most innovative procedures were developed in response to a need to solve a policy problem defined by forces outside of the traditional planning community, such as those of a state executive branch, a legislature, an environmental agency, or even a chamber of commerce. Importantly, the breadth and variety of those policy-driven issues are, in themselves, a major conclusion of this research. This chapter covers four examples of highly innovative multimodal planning practices, each driven by a significantly different overriding policy concern. In eastern Washington State, agricultural products are being analyzed in terms of their competitiveness in the global marketplace, and traditional roadway improvements are being recommended. In Portland, OR, the growth management ordinance requires that urban densities must increase, while traditional roadway investments are being minimized. In Puget Sound, data is being organized in response to a concern that transportation policies based on growth management may squeeze out needed improvements to freight flows. In Wisconsin, the needs of manufacturers to ship their goods efficiently have been integrated into the technical procedure of forecasting demand for intermodal solutions in the area.

### THEMES

Four major themes are revealed from the case studies of this chapter.

**Multimodal planning is not an end state.** Multimodal planning can best be seen as a set of tools that are applied

toward a public policy purpose. The best solution to a transportation need might be an investment entirely in highways or entirely in nontraditional expenditures. The role of the tools is to provide robust power in the analysis of need, not to predetermine the modal nature of the plan that results from the process. When multimodal planning is seen as the imposition of one set of policy preferences over another, it is often resisted.

**Multimodal planning is best carried out when “all modes are analyzed simultaneously and interactions among the modes are accounted for.”** (8) The importance of multimodal planning neither hinges on the number of modes selected in the final outcome of the process, nor on the number of separate modal analyses ultimately assembled into a final plan. The preparation of separate modal plans, and their integration at the last minute in the capital budgeting process, may or may not be an example of good planning procedure, but it does not represent multimodal planning as examined in this report. Based on the observation of the case studies undertaken for this project, it is clear that multimodal planning is best carried out when “all modes are analyzed simultaneously and interactions among the modes are accounted for.”

**Multimodal planning practices are most needed when applied to planning that is driven by policy needs, rather than the analysis of facilities.** When the *efficiency* of the facility, as seen by the facility owner or manager, is being examined, single modal measures are highly appropriate and often used. However, when it is the *effectiveness* of the system in terms of bringing about an end state desired by public policy, modally oriented descriptions of the facilities often fail to translate back into terms usable by policymakers in accomplishing their objectives.

**It is valuable from a methodological point of view to organize the basic data in terms of the characteristics and needs of the person or thing needing the transportation.** To create analysis that is usable by the policymaker dealing with issues relevant to the rest of society (economic development or impact on the environment), it is valuable from a methodological point of view to organize the basic data in terms of the characteristics and needs of the person or thing needing the transportation rather than for facility capacity. Particularly for freight, data oriented in terms of the commodity transported is a more powerful and robust way to

organize data than in terms of zonal aggregations and zonal averages.

## CASE STUDIES

### Case Study A: Eastern Washington Intermodal Transportation Study

#### *Background*

The Eastern Washington Intermodal Transportation Study (EWITS) was designed to apply certain principles of ISTEA planning to an area that is primarily nonurban with an economy primarily based on agricultural production. It was created and funded under the ISTEA legislation and provides for the expenditure of \$3 million over the 6-year life of the study. According to its managers, the study was designed to help policymakers deal with issues specifically identified in ISTEA, including the integration of freight into the planning process and the analysis of border-crossing issues at the time of NAFTA and other trade agreements with Canada. Its four objectives are to

- Facilitate existing regional and statewide transportation planning efforts;
- Forecast future freight and passenger service needs for eastern Washington;
- Identify gaps in eastern Washington's current transportation infrastructure; and
- Pinpoint transportation system improvement options critical to economic competitiveness and mobility within eastern Washington [Ref. 1-91].

#### *Innovative Methods in Data Collection*

The analytical power of EWITS is based on the strength of a large-scale survey of truckers in Washington State. Over 28,000 truckers were interviewed in Washington State over four seasons, at 28 separate locations, involving a data collection staff of 300 persons. The goal was to provide statistically reliable information on truck characteristics and commodity flows for all major Washington highways. In addition to data about trucks, the survey established the origin and destination, commodity, specific route, and use of intermodal facilities. The sample had a response rate of over 90 percent, which in itself is a positive statement on the effectiveness of the data collection methods.

Among the many uses for the origin-destination (O-D) data specified in the study were to identify corridors of most importance to specific industries and estimate the economic value of specific commodities shipped on specific corridors. To gain this focus on the details of the goods being carried, the process utilized the definitions of the Standard Industrial Classification (SIC) codes. The truck drivers reported that

they carried 3,167 separate commodities, to which the survey managers assigned either a two-, three-, or four-digit SIC code, depending on the level of detail given by the driver. The study applied economic values for commodity by tonnage based on relationships established in the 1977 census of transportation, which were updated using the Standard and Poors Producer Price Index to 1994 values [Ref. 1-91].

The observation that the study used data definitions provided outside of the transportation sector will be a recurrent theme throughout this chapter because transportation planners are increasingly asked to respond to policy questions that deal with societal issues such as economic and environmental planning. The EWITS report on data collection notes that "use of the Standard Industrial Classification codes for cargo transported by Washington trucks also provides a means to project future growth in cargo tonnage on selected Washington highway segments, [utilizing] the 20 year detailed industry output growth forecasts prepared by the U.S. Bureau of Labor Statistics" [Ref. 1-91].

#### *Understanding the Mobility Needs of Wheat and Barley*

More than any other planning effort revealed in the research, EWITS is organized in a manner that allows an almost micro-level understanding of the transportation needs and characteristics of different commodities, which, in turn, can be used to understand the implications of policy interventions that could impact the industry associated with that commodity. The substudy, "Transportation Characteristics of Wheat and Barley Shipments on Haul Roads to and from Elevators in Eastern Washington" can be used as an example of the detail applied. The first five chapters of that report are

- Chapter 1: Elevator Characteristics;
- Chapter 2: Seasonality of Wheat and Barley Deliveries to Elevators;
- Chapter 3: Seasonality of Wheat and Barley Deliveries from Elevators;
- Chapter 4: Destinations for Wheat and Barley Shipped from Elevators; and
- Chapter 5: Modal Choice for Wheat and Barley Shipped from Elevators [Ref. 1-177].

From this structure, the result is an analysis of trip generation, trip distribution, and mode split for wheat and barley. With the data organized in this manner, the micro-characteristics that affect the success or failure of this industry can be examined and understood by policymakers. The flow of grains using local elevators is described in this EWITS report. "Grain is delivered at harvest time to an elevator within a relatively short distance of the field . . . Farmers wish to minimize the transport time from the field to

initial storage so as to have the trucks available to empty the combines in the field and keep the combines harvesting grain." EWITS found that farmers did indeed keep this truck trip short. Of the clients to a given elevator, 88 percent travel less than 10 miles. As such, there is no issue of "mode choice" from the farm to the elevator—the farmer's truck is used. The journey from the elevator is far more multimodal in character. Almost 80 percent of the wheat leaving the elevators of eastern Washington is carried by truck to the barges of the Columbia River complex [Ref. 1-177].

The EWITS data has been organized to help the policy-maker understand the real market forces underlying the barley shippers' decisions about mode. The choice of mode is influenced by price, which, in turn, is influenced by the competitive modes available. EWITS reports that "the economic forces created by the competition between rail, truck, and barge have provided the most competitive transportation rate structures of any grain producing area in the United States, an important factor as global markets become increasingly competitive . . . In general, the closer a county is to the river system, the greater the differential between single rail rates and 25/26 car rail rates. This suggests that truck-barge rates create a downward pressure on bulk rail rates." This free-market battle between carriers causes the rates to lower. In interviews with the state manager of this study, the research team asked about the interests of the grain farmer in multimodal options. He responded quickly that the industry wants two available modes of choice on every route, a phenomenon revealed quantitatively in the EWITS analysis [Ref. 1-177].

The several segments of the total trip from farm to flour mill or brewery have been documented by EWITS. With this understanding of the needs of the commodity being transported, strategies can be designed from the vantage point of the industry affected. Armed with this data, the decision maker is in an optimal position to evaluate alternative investment toward a given policy goal, such as "improve the international competitiveness of our wheat industry."

#### *Relationship to Planning Decisions*

From these observations, EWITS can be viewed as of great value to the analyst of the wheat industry or the barley industry; but, of what value is data organized in this manner to the transportation agency itself? Given the benefits that accrue to the wheat or barley industries, what are the costs associated with providing the infrastructure to serve that industry? To answer these questions, a corridor planning analysis was undertaken to reveal the flow patterns of the major commodities.

As described in EWITS, the study of the flow of wheat and barley is largely the study of flows to ocean elevators along the Columbia River or to major (long train) rail distribution points. These flows can be analyzed in terms of the demands

being made on the highway system. The major O-D patterns for hay take the form of east-west movements from eastern Washington to the Seattle/Tacoma port system, while the major movements of fruit are generally to the south in major flows toward Oregon and California. The detailed information in the study allows for a variety of applications, including route diversion, modal diversion, and importantly, an understanding of the issues associated with cost allocation [Ref. 1-180].

By way of example, EWITS calculates that the transport of wheat and barley in eastern Washington annually accounts for about \$22.2 million of highway deterioration on state roads and \$5.3 million of deterioration to county roads. Of the total cost to both state and county road agencies, some 60 percent of this is attributable to shipments between the farm and the ocean river ports, with 30 percent attributable to movements between local elevators and the river ports [Ref. 1-177].

#### *Relationship to Policy Formation*

A good example of the effectiveness of flow data organized by commodity rather than by facility is the March 1995 analysis of the impacts of a possible drawdown of the lower Snake River. Because of environmental concerns, the possibility of closing the river to barge traffic has been put forward by environmental authorities. According to its authors, they were able to undertake a meaningful analysis of the impact of several possible scenarios on traffic and pavement damage in a matter of days because the raw data concerning the movement needs of the impacted commodities were already prepared by EWITS [Ref. 2-87].

The authors built a scenario in which the longer truck hauls for the river system are replaced by shorter truck hauls to locations on the rail system with multiple car rates. The result is an increase in cost to the shipper, for whom the truck/barge combination was always the cheapest mode. The analysis helps the decisionmaker to understand where the roadway damage would occur and to understand the severity of that damage. For the state roads used on the longer haul to the river, a significant 63 percent decrease in dollars of damage was forecast. At the same time, the report examined dollar impact per mile and noted, "It is evident that the road damage decreases with the drawdown situation, but in fact the accelerated wear per mile on selected routes is much greater . . . because of the high volumes transported and the short distance that the grain is moved. This impact per mile for the short trips we term as 'pockets of destruction.' " [Ref. 2-87]

Consistent with the market-driven characteristics of the study data, the authors also create a scenario whereby the demand for rail service increases, but the railroads fail to supply an adequate number of grain hopper cars. In this scenario, grain that would have been attracted to the rail system must be carried further down the river system, where barge ser-

vices will still be allowed. Under this supply scenario, state roads would bear the largest dollar value of damage, experiencing a 50 percent increase in impacts compared with the no-drawdown situation.

Although this quick study did not forecast modal diversion *per se*, it did support decisionmakers in their need to understand how the several modes could interact under several different demand and supply scenarios. Depending on the scenario, a significant increase in roadway damage can be predicted, either immediately surrounding rail interchange points or along roadways to more accessible parts of the river barge system. "The results of this analysis indicate a need to invest in the infrastructure to ensure the preservation of surface transportation to move grain." [Ref. 2-87]

### *Relationship to Programming*

Jerry Lenzi, the Washington State manager responsible for developing this program, advocates a process of "life-cycle cost programming," in which key roadways are rebuilt every 12 years to minimize the cost of total reconstruction after major damage occurs. In this prioritization system, the number of days of weight restriction is one of the most important evaluative criteria, followed by cost, volume on the link, and characteristics of the route, which include a safety-oriented risk analysis, community support, and economic analysis. EWITS has provided the base data with which to calculate the economic implications of the investment, particularly when the road is placed out of use by weight restrictions for significant periods of the year.

EWITS is designed to identify present and future problem areas. Because the process is essentially behavioral (i.e., modeling process parallels economic decisions actually undertaken), it is based on an understanding of the implications of the goods carried. Thus, a forecast of an unusually heavy lumbering season, can predict the accelerated deterioration of one set of roadway links, while a forecast of unusually high hay exports can lead to a forecast of accelerated deterioration on a different set of roads. To Lenzi, the key is the ability to forecast the need to make an early investment and to invest wisely in terms of the least life-cycle cost approach. To do that, it is desirable to forecast how any given economic future may affect the need for investment.

In the interview with Lenzi, the question of the impact of innovative planning methods on actual decisions to fund or not to fund facilities was explored. Lenzi described State Route 20 as the kind of road that is generally considered a problem by managers. With the spring thaw, the road is out of commission, and trucks are excluded for months at a time because of their damage to the road. But analysis of the economic function of that road and its role in supporting the wood products industry led the planners to advocate a major upgrading for the road with the goal of removing the weight restrictions and making it suitable for truck

movement year-round. From the vantage point of the highway manager, trucks were a massive cause of damage and deterioration. But the same investment, examined in terms of its relationship to its economic function, was ranked as a high priority for statewide investment and included in the annual statewide transportation improvement program (STIP).

EWITS is designed as a decision-support system and not as an automation of the prioritization process. Importantly, *EWITS will not make cross-modal comparisons and recommend one particular modal solution over another*. Rather, it will provide a better understanding of the economic implications of each of the candidate strategies, and with this information, it gives the manager "tools to go to the political process and argue."

### *Lessons Learned*

EWITS emerges from this research as an excellent "teaching example" to illustrate many of the major policy thrusts inherent in ISTEA planning. Although ISTEA instructs practitioners to improve the mobility of persons and goods, very little explicit direction is supplied to instruct them in how to do this. In eastern Washington, EWITS was not undertaken as a study to look at the efficiencies of the highway system, the rail system, or the river barge system. Rather, the fundamental building block of analysis in EWITS is the detailed understanding of the needs and the total trip pattern of each major commodity produced in Washington. In one particular economic or environmental scenario, those flows may best be served by a combination of those modes or by none at all.

By gaining an understanding of the mobility needs of barley, the analyst is in a strong position to evaluate the *effectiveness* of the system, for example, from the point of view of the barley industry. When the policymakers of the state establish a goal that is defined in terms of economic development, such as "maximize the competitiveness of barley on the world market," the planners armed with the EWITS database are in a strong position to undertake the policy-driven planning task assigned to them.

Of equal importance, EWITS demonstrates that organization of transportation information, in terms of the needs and characteristics of the commodity being transported, has powerful application in terms of the ability of the transportation agency to judge the *efficiency* of its own system and its own actions. Armed with knowledge that demand for heavy wood products is increasing, the transportation analyst can take actions to improve the impacted infrastructure before the increase in damage actually occurs. In taking this action, the planner is directly participating in the kind of analysis required by the Bridge and Pavement Management Systems—both classic examples of the process of monitoring for the *efficiency* of the system.



In summary, EWITS demonstrates the breadth of application of the concept of planning for the mobility of persons and goods.

### **Case Study B: Policy-Driven Programming in Portland, OR**

In the previous case study, the tools of multimodal planning and analysis were used to examine the needs for freight in eastern Washington State, which led to the recommendation for programs to upgrade certain roads and bridges essential to the needs of that region's agricultural economy. In EWITS, the analysis of the total trip characteristics of the goods being carried and the analysis of the modal alternatives to deal with those needs resulted in the programming of State Route 20. This stands as an example of the tools of multimodal planning, resulting in a decision to build a single-mode solution. In neighboring Oregon, the tools of multimodal planning are being used to solve other policy issues, resulting in markedly different outcomes.

#### *Background*

In Oregon, the dominant policy-driving transportation decisions stem from legislation passed in 1973 creating the Department of Land Conservation and Development to carry out its growth management strategy. Within Oregon's Statewide Planning Goals and Guidelines, "Goal 12" spells out the rules for the conduct of transportation planning, requiring that the transportation plan shall "conform with local and regional comprehensive land use plans." These transportation plans "should be revised in coordination with local and regional comprehensive plans and submitted to local and regional agencies for review and approval" (9). In addition, a separate state process of monitoring progress has established certain "benchmarks," one of which calls for the progressive lowering of vehicle miles traveled (VMT) per person over time.

As explained by the Director of Portland Metro, in the early 1970s there was great sensitivity to the loss of farmlands by the uncontrolled growth of suburban and exurban residential development. As a result, legislation was passed that made clear distinctions between urban areas, defined by specific growth boundaries, and the agricultural areas to be preserved. State law provides for a markedly favorable tax structure for those lands that are used for exclusive farm use. Now, every city in the state has an urban growth boundary, and the job of the urban plan is to accommodate the expected urban growth within that clearly defined boundary. Under present law it is difficult to alter an urban growth boundary. Portland Metro was created to fit into the state required framework; its charter mission is growth management, and transportation is seen as a strategy element toward that end. Having examined the alternative futures for Portland's

growth boundary, Metro supported the idea of containing growth in an area about 6.5 percent larger than the present boundary.

Thus, the transportation planning practitioners in Portland are bound with a very specific responsibility: to design the transportation system in a manner that will bring about the land use futures to which transportation is seen in a subordinate, supportive role. Two conditions have been established outside of the process. First, a growth boundary has been determined within which the urban activity is to be located. Second, within that fixed geographic area, benchmarks have been established to lower VMT per resident. Within this context, the planner is in effect asked to solve two equations simultaneously: the planner is to evaluate land use configuration scenarios and transportation networks serving those configurations. In the programming process, the planner examines each candidate investment in terms of its ability to bring about this desired end state.

#### *Innovative Multimodal Programming Techniques in Portland*

Faced with carrying out a policy in which transportation investment must, by statute and charter, implement the adopted land use vision of the region, planners in Portland have been forced to reexamine the traditional process of planning and programming. Every transportation investment decision is examined in terms of its influence on the adopted development vision. Key technical questions include the effect of a given investment on trip making behavior, particularly in terms of the distance of the trip, and ability to substitute nonmotorized solutions on all or part of that trip.

To understand the nature of demand being placed on the multimodal planning process, it is worthwhile to review the actual programming decision made in Portland at the time of the interviews in 1995. Portland Metro has established a program of ranking projects within general categories, utilizing the evaluative criteria appropriate for the category. Thus, a bikeway does not get evaluated in terms of level of service (LOS), and a road expansion need not be evaluated by the number of additional bikers it attracts. Table 2 shows the category and the evaluative scheme used within each category. Planners in Portland Metro pointed out that no matter which category a given project was considered under, consistency with the established land use plan represents 25 percent of the evaluation (10).

#### *Programming of Mill Avenue/Henry Street*

During the interview process, the research team asked the manager of the programming effort in Portland for an example of the impact of multimodal planning on capital decisions. He described the decision to fund the Mill

Avenue/Henry Street project. By many traditional LOS- or volume-to-capacity-oriented evaluation schemes, this project would not have received funding. Indeed, it was not even an example of private development “ready to go” with the infusion of some additional public aid. Rather, it is a project to create a traditional small block grid of streets immediately adjacent to a major light rail transit. In terms of market readiness, its project evaluation sheet notes that there is no major project “on the table” but, finishing the two streets might “encourage proposals and leverage higher density development agreements as a condition for access to the public funds.” As for alternatives, it notes, “market demand driven improvements would not be expected to provide the requisite street character.” (10)

A sense of the demands being made on the planning process can be obtained by looking at the modal criteria used in the 1995 allocation of surface transportation program (STP) funds. Looking, for example, only at the category of transit-oriented development (TOD), the criteria demands to know the following:

Will the Transit Oriented Development project increase the number of transit, bike, walk trips over the number that would be expected from a development that did not include the public funds for the TOD project? (11)

Thus, the investment at Mill Avenue/Henry Street was calculated on the basis of a “pedestrian environment factor” of 12 with the transit-oriented development project, compared with a “pedestrian environment factor” of 4 without the project. These factors were applied in a trip generation calculation that predicted a 15.4 percent increase in nonautomobile trips for this development over a base case development. On this basis, the Hill Avenue/Henry Street project was granted 25 points out of a possible 25 points within the category, “percent mode change” (10).

The evaluation scheme calculates the decrease in the number of VMT attributable to the increase in nonmotorized travel and compares this “benefit” with the “cost” of the project. In this case study, a ratio of “\$22.77 per VMT reduced” was considered worthy of awarding 8 out of a possible 15 points.

### *Outcome of the Programming Process*

Table 3 shows that of the nearly \$26 million being allocated, only about \$14.8 million was spent on traditional roadway projects, about 57 percent of the proposed budget. In fact, a more detailed examination of the two projects included in the Road Preservation (or Reconstruction) Category reveals that the high ranking of these two projects stemmed largely from their role in pedestrian, bike, and transit use of the facilities. Phrased differently, roadway *expansion* comprises only about 36 percent of the total budget being prepared by the MPO. During the last funding cycle

(spring 1995), projects worth \$150 million were submitted for about \$27 million of funding (12).

### *Innovative Multimodal Practices Under Consideration*

This brief look at the kind of information required by the programming process in Portland underscores the methodological challenges that face the integration of land use decisionmaking with transportation decisionmaking. In the example used in this case study, a “transportation dollar” was expended for the purpose of building a local street that would encourage a certain land use configuration, which would, in turn, encourage a certain nonautomobile trip generation pattern and would bring about a lowering of traditional motorized miles of travel. This VMT reduction was, in turn, used in the calculation of the justification of the local street investment.

As shown in this example, planners are working on methods to integrate the separate methodological traditions of travel forecasting and land use impact analysis. To accomplish this task, Portland planners argue that the primary method of evaluation should be based on accessibility rather than on mobility. Whereas a mobility-based measure might ask, “how many minutes to your job?” an accessibility-based measure would ask, “how many jobs are within X minutes of this residence?” or conversely, “how many residences are within X minutes of this job location?”

The difference relates, at least in part, to the kinds of policy questions being asked of the planner. If the land use is fixed (if the planner is not asked to consider the location of either the residence or the work place), then the relevant question is, “how fast can we get the traveler to the workplace?” If the planner is also being asked to review land configuration options and impacts, then the relevant question becomes “how many jobs become linked with this residence as a result of this option?”

To create an aggregate measure of accessibility for a community, for instance, rather than for a house, the same process is applied. In effect, the question “how many jobs are available from my house within X minutes?” can be calculated for every house in the region, creating what is known as a composite accessibility index. Under consideration at the moment in Portland is a process of describing areawide accessibility with the use of a “mode and destination model, which reflects generalized cost of travel, modal characteristics, and quantity of the desired active at the destination location.” The model would use a multimodal factor for the travel times when more than one mode is available for the trip. The technical requirement is for a destination and mode choice model. As a candidate land development is considered, the planner must forecast how this development will attract new trips, from where, and by what mode.

A given land activity or transportation facility, or composite of the two, could be analyzed quickly for its effect-

TABLE 2 Portland's weighting of criteria within each category of investment

Category of Investment	Roadway Preservation	Roadway Expansion	Transit Oriented Development	Transportation Demand Management	Bicycle Projects	Pedestrian Projects	Freight Projects	Transit Projects
Criteria/ Weighting	1990 Pavement Condition 15	1990 V/C Ratio 15	% Mode change 25	VMT Avoided 30	New Rider 15	Walk Trip Potential 15	Improves Connectivity 25	Boarding Delta 1990 - 2015 25
	2015 Pavement Condition 10	2015 V/C Ratio 10	Density Delta 25	2040 Support 25	Regional Systems Connection 20	Trip Inducement 10	Improves Safety 20	2040 Support 25
	Accident Rating 20	Accident Rating 20	2040 Support 25	Cost/benefit 25	Safety (Road Type) 10	Existing Safety Risk 25	2040 Support 25	\$/VMT Reduced 20
	2040 Support 25	2040 Support 25	Cost/Benefit 15	Multimodal 20	Safety (Yes or no) 5	2040 Support 25	\$/Vehicle hours of Delay 15	Multimodal 25
	\$/VMT 15	Cost/ Benefit 15	Multimodal? 10		2040 Support 25	\$/ Other points 15	Multimodal 10	
	Multimodal 15	Multimodal 15			\$/VMT Avoided 25	Multimodal 10		

TABLE 3 Allocation of 1995 surface transportation funds by Portland Metro

	Roadway Preservation	Roadway Expansion	Transit Oriented Development	Transportation Demand Management	Bicycle Projects	Pedestrian Projects	Freight Projects	Transit Projects
Dollars	5,494,000	9,306,000	6,708,000	359,000	1,440,000	1,015,000	1,737,000	320,000
Percent of Total	21%	35%	25%	1%	5%	4%	6%	1%

tiveness in linking persons with destination activities. As one of the authors notes, “the resulting accessibility index is a comparative value. One can see how accessibility changes for a given [zone] under different scenarios, or can compare the value between [zones] within a scenario.” In its final development, such a modeling capability would begin the task of undertaking the simultaneous analysis of transportation and land use options.

### *Lessons Learned*

In Portland’s capital programming process, candidate transportation investments are examined for their ability to attain certain clearly stated policy objectives. To carry out this policy-driven planning, the practitioner examines the decisions made by the tripmaker, rather than focus on the characteristics of the facilities or links in the system. In a proposed procedure, the needs of the person or thing needing transportation will be examined in terms of their destination and their mode simultaneously. Overwhelmingly, it is the accessibility of the person that is examined; characteristics of the efficiency of a given facility are noted but are not considered ends in themselves.

### **Case Study C: Freight Planning in Puget Sound**

The analysis of freight movement, in particular those movements carried by truck over the public road system, represents one of the biggest remaining challenges in the implementation of ISTEA planning requirements. EWITS has demonstrated how the analysis of specific commodities can improve the statewide awareness of the needs of those commodities and improve the understanding of how these flows impact state and county facilities. At the MPO level, many examples exist of improved relationships with stakeholders affected by freight movement, with excellent examples existing from Philadelphia to Oakland. However, only a small number of examples exist where MPO planners have tried to quantitatively understand the flow of freight *within* the metropolitan area and to use modeling procedures to better understand policy options toward those flows.

Across the country, MPOs are making great progress in reaching out to members of the freight community, both carriers and shippers, attempting to incorporate them into the planning process. But, a common theme revealed in the research is that, once the new participants were “brought to the table,” there was little quantitative knowledge about the nature of the freight flows in the region discussed “at the table.” In many cases, MPOs have proceeded with a user-based approach, asking about the problems in the industry as perceived by the participants, without claiming to have analytical planning tools and procedures to actually apply in the solving of those problems. In the phase one research for this project, it became clear that in the Puget Sound Regional

Council (PSRC), work was underway in the areas of stakeholder participation and of preparation to integrate freight flows into the urban transportation planning process. The PSRC was an early innovator in the area of MPO understanding of freight issues and the development of innovative planning methods and techniques.

### *Background*

In 1994, Washington’s statewide Growth Management Act (GMA) was amended specifically to require that the transport element of the local comprehensive plan must address freight and goods movement. Washington State’s growth management legislation was in many ways inspired by, but fundamentally different from, the laws of Oregon. The GMA starts with the vision that land use and transportation are inherently linked and that law calls upon regions to establish growth policies. It is established in law that those growth policies must be served by the adopted transportation strategy, but it does not dictate the fundamental direction of that growth policy. In theory, a rural region hungry for economic development could advocate for unbridled growth and still be within the theme of the law. It is the role of the regional planning organization to review the local transportation proposals to ensure that they are consistent with the adopted growth policy.

This approach gives a sound statewide legal basis for the urbanized areas to establish policies to limit the geographic spread of growth. PSRC’s adopted plan states the following:

The crux of the strategy is to encourage future growth to take place in a more concentrated manner within designated urban growth areas. Concentrating growth will encourage transit usage, ridesharing and pedestrian trips, thereby reducing the growth in traffic congestion, air pollution and fuel consumption. It also reduces the pressure to develop open lands and environmentally sensitive lands. [Ref. 2-125]

Through the PSRC process, policy-driven multimodal planning resulted in a capital allocation program in which 60 percent of discretionary funding in Puget Sound was allocated to projects other than roadway improvements. But the regional policies that discourage transport investments, which might increase sprawl (i.e., increased highway capacity), have raised serious concerns on the part of the leaders of the freight community. Policy-driven programs that do not increase available roadway capacity, and in the case of certain kinds of HOV lanes, might decrease available roadway capacity, have caused leaders of the freight community to organize themselves to ensure that the values associated with freight movement are incorporated into public policy.

### *New Institutional Practices for Freight*

The Regional Freight Mobility Roundtable was established by a private organization, the Economic Develop-

ment Council, as a mechanism to connect the agencies with shippers, carriers, and third parties. As described by Peter Beaulieu, the manager of the project for PSRC, three objectives were established for the process: first, the agencies were asked what kinds of policy issues they wanted to hear about; second, PSRC committed to the construction of a freight database to support regional dialog; and third, the roundtable committed to making a series of recommendations.

Concerning the first and third objectives, the policy issues of concern were defined early, and recommendations concerning infrastructure issues, institutional issues, and operational issues were made and acted upon. By March 1995, their recommendations had been integrated into the MPO planning process; in the summer of 1995, the formal policies had been incorporated by the PSRC board. As an outcome of this process, the Economic Development Council has established a speaker's bureau to explain freight concerns to groups interested in the planning process. The primary concern in this case study focuses on the second objective, that of building a freight database to support the roundtable's request for a regional dialog and to apply it to specific problem-solving tasks.

#### *Innovative Methods in the Analysis of Freight Movement*

In an early and innovative effort, PSRC assembled a consultant team to undertake an analysis of freight movement in the Puget Sound region. The consultant team has made a significant contribution to the study of freight in metropolitan areas by merging different kinds of data, including census countywide business patterns, the Dunn and Bradstreet Market Locator, and certain proprietary data formulations of the lead consultant, Transmode, Inc. The purpose of this new process was "to lay out in a simple and direct way the data needed for freight planning." [Ref. 2-4]

Most important, the study managed to utilize the power of data disaggregated to the four-digit commodity level, combining this with zone-by-zone information describing the location of the trip generators. For flows from a manufacturing facility, Transmode's proposed method starts with Bureau of Census County Business Patterns data, which annually document the number of establishments and number of employees operating in each county by SIC code category. (Data from four counties were used in Puget Sound region.) This census source provides the number of employees, total wages, and number of establishments by size. Transmode then provides an estimate of the freight flows out of the establishments in each 4-digit SIC category. The total dollar value of the product is calculated "using the value added coefficients from the National Income and Products Accounts" based on the number of employees for each industry by SIC category. Transmode then uses its own formulas

to calculate the number of tons from the dollar values for each commodity as estimated above, which is then expressed as truckload equivalents of annual production. A similar exercise is undertaken for materials coming into the manufacturing establishment.

Thus, in one of the first such programs managed by an MPO, freight-trip generation calculations are created as a function of the actual makeup of establishments within a given analysis zone, not on the basis of generalized vehicle generation rates by land use category. The Puget Sound freight analysis methodology organizes data on the basis of the known characteristics of the person or thing being transported, not on aggregate characteristics of facilities or land. The power implicit in this approach is readily evident; for example, when the yearly update of the County Business Patterns immediately informs the analyst of the change in the makeup of those manufacturing industries that originate and terminate freight movements. Transportation analysts, having based their methods on the needs of the commodity itself, can update the analysis of flows without waiting for a new land use survey.

Having established the generations and terminations in terms of truck load equivalents, other data must be accessed to determine which portion of that overall flow is carried by other modes, such as rail. The portion of the overall flows that is carried by rail can be readily accessed from existing ICC Rail Carload Waybill surveys. These rail flows can be expressed as truckload equivalents for use in this analysis. Flows by most modes (other than truck), are similarly available for incorporation into the calculations and can be expressed in terms of truckload equivalents.

#### *Developing a Portrait of Metropolitan Freight Flows*

Working with a wide variety of sources, the Puget Sound team has assembled an understandable portrait of freight flows using the facilities of the region, whether internal to internal, internal to external, or passing through. [Ref. 2-4].

On the basis of a process of iterative reconciliation to deal with the problems inherent in multiple data sources, the Puget Sound team has estimated the makeup of the region's truck movements. The analysis estimates that there are approximately 300,000 truck movements per day in the Puget Sound region, which make up about 3.5 percent of all vehicle trips and 6 percent of the VMT for the region. Of those 300,000 trips, more than 200,000 trips are short-haul in nature, compared with under 20,000 long-haul trips. Only about 10,000 truck movements were attributable to through trips. The authors of the study noted the remarkably dominant role of truck trips to and from points of wholesale distribution, which they estimate to be between 70 and 85 percent of all movements [Ref. 2-4].

### *Relationship to Programming*

It is useful to review how the freight data have been applied. At the time of the project interviews, no decision had been made to actually model O-D freight flows in the metropolitan area. The Puget Sound freight work was not focused on forecasting flows on highway links but rather at educating the political process about the nature of these flows and their relative importance in the economy. Regarding the possible decision to invest considerable resources in the development of methods to forecast freight flows on existing highway networks, Puget Sound is taking a cautious approach. The initial technical report recommended that “future work will use the information developed using the Truckload Movement Estimator to develop freight trip generation and attraction rates on a trips per employee basis for different types of land uses.” At the present time, the primary purpose of the freight analysis method is not for direct input into decisions about capital prioritization. Rather, the roundtable serves as a sounding board for a wide variety of issues, such as the use of HOV lanes for high-priority movements during the off-peak hours. The carefully quantified descriptions of the nature of freight flow in the region have been valuable in understanding those issues.

A key issue for those deciding about freight modeling is the problem of nonrecurring incidents. Existing trip assignment and analysis methods will produce average, or normal, travel times and flow characteristics. But the Freight Mobility Roundtable members have concluded that the most important factors for analysis are the *variation* in travel times and the possibility of arrival after the expected hour, not the average conditions for the trip. In the minds of several participants in the process, the lack of ability of the assignment process to deal with this issue relegates it to a lower priority.

In a 1996 follow-up interview, the project manager reported that much of this data was expected to be refined for use by the Tacoma-Seattle Freight Corridor Action Strategy, where the original start-up work could be applied on a limited geographic basis to the study and analysis of bottlenecks influencing freight flows.

### *Lessons Learned*

In summary, the Puget Sound effort can be categorized as primarily based on stakeholder participation, with supporting roles from quantitative support. Within that support effort, two major contributions have been made. First, an MPO was able to begin the analysis of freight flows built upon an understanding of basic economic characteristics and an understanding of the nature of the logistics chain. Second, the analysis team undertook the difficult job of creating an aggregate summary of freight movement in their region.

For this report, the analysis method developed in Puget Sound is not based on zonal aggregates summarizing overall

land use patterns but rather on the known characteristics of the commodities themselves, as tracked in the Census County Business Patterns. In this process, the needs for mobility of high-value, low-weight electronics are never averaged with the mobility needs of low-value, high-weight cement products, which are all hidden under a land use category such as “manufacturing.” This represents a shift away from reliance on data as organized for the study of traffic flow toward the utilization of data used by other sectors in society, which increasingly are defining and driving the policy issues that the transportation planners need to analyze.

## **Case Study D: Policy-Driven Planning in Wisconsin**

### *Background*

In both eastern Washington State and in Puget Sound, building blocks of freight planning are being assembled, which, in their final development, could be transformed into full-scale, zone-to-zone forecasts of freight flows. These freight flow forecasts could be assigned to modally specific networks and thus integrated with the ongoing transportation planning process. In Wisconsin, a full-scale simulation of freight flows, based on a forecast of zone-to-zone flows and incorporating a state-of-the-art approach to mode choice, has been successfully incorporated into the development of the state’s multimodal transportation plan. In their words, “the plan is a true multimodal transportation plan because all modes are analyzed simultaneously and interactions among the modes are specifically accounted for.”

In Wisconsin, the planning process was structured from the beginning to deal with end users and to understand their viewpoints concerning freight transportation issues. And, importantly, the study was not based on a rail, truck, or air cargo planning element. To the contrary, the study was based on a careful examination of the characteristics of the commodities to be transported, on a commodity-by-commodity basis, often using the detail of the full 4-digit SIC code. On the basis of an understanding of the peculiarities of each commodity, judgment calls were made on the appropriateness of several modal solutions to serve, or to divert, that particular commodity.

In April 1993, *TransLinks 21*, Wisconsin’s process to develop a long-term multimodal statewide transportation plan, gathered key shippers and carriers together to get their input about incorporating freight into the statewide planning process. In their report on that freight forum, *TransLinks 21* managers summarized that the logistics revolution in Wisconsin has produced a context in which “transportation needs are identified as an element of overall logistics costs with an emphasis on efficiency, reliability and seamless connectivity, rather than a predetermined preference for any particular mode or set of modes.” [Ref. 1-202]

From this original meeting, Wisconsin DOT (WisDOT) formalized the creation of the Freight Expert Panel, which would become an integral part of the actual technical analysis undertaken in *TransLinks 21*.

### *Innovative Methods in Freight Forecasting and Analysis*

In a highly unusual step for statewide planning, WisDOT actually built a trip table of freight flows within Wisconsin. With externally supplied growth factors, a base case (trends extended) forecast was developed and assigned to truck, rail, waterborne, and air services on the network. The professional team developed a variety of future scenarios for each mode; then, before the quantitative analysis phase began, the state's Freight Expert Panel reviewed the candidate scenarios and recommended modifications. This led to the identification of the truck-rail scenario as one worthy of further testing, and the Freight Expert Panel helped in the administration of a major survey. "The survey was designed to evaluate the relative divertability of commodities in the multimodal database, and to identify other service characteristics necessary to influence mode change and alternative truck-rail intermodal haul-distance break points." [Ref. 1-1-4]

To build the future trip table, a 1992 trip table was first created. Like many states, Wisconsin selected the Transearch Database developed by Reebie Associates as the basis on which to build the full multimodal trip table. The Transearch Database integrates data from some 75 separate sources, most of them publicly available. In addition, some data are available from proprietary programs, such as the Truck Data Exchange.

The standard Transearch Database is built in four steps. First, total levels of production and consumption are estimated using tools of economic forecasting and analysis. Second, the flows known to be carried by rail, air, and water are calculated from empirical sources. Third, flows carried by truck are calculated by subtracting the other modes from the first calculation of total volumes; these volumes are cross-checked against the proprietary data from the Data Exchange. In the fourth step, statewide totals are then disaggregated into Business Economic Area (BEA) zones, based on economic data by county and known trade patterns between industries. Relatively minor additions had been created for Wisconsin to incorporate some truck shipments of nonmanufactured goods and shipments from freight distribution facilities.

### *Development of New Statewide Planning Methods*

To create usable data in the transportation planning process, the data had to be disaggregated to the level of 106 counties. Reebie Associates applied a process that was simi-

lar in nature to the creation of BEA data down from the state-based data, using a four-step process. Starting with the BEA to BEA flows that were available from the augmented Transearch database, these flows were considered by a 4-digit commodity code for each link in the large zone network. For each commodity, origins of flows produced in each BEA were disaggregated by the county of location for each facility, weighted by the employment at each facility. For each commodity, destinations of flows consumed in each BEA were disaggregated by first examining the trading relationships between industries, as revealed in national input-output tables. Then the destination volumes were allocated over the counties on the basis of the location of the identified industries and the general consuming population. Once the base case calibration had been completed, the task of factoring up base year flows to various study years was a relatively straightforward application of externally defined growth factors (by WEFA Associates) for commodities and populations, in a manner not unlike the traditional "Fratar" method of trip table updating.

On the basis of discussions with the state managers of this process, major breakthroughs were accomplished in transforming data originally conceptualized at one zonal scale to the much finer grain scale required to support the traffic assignment process, which needed freight data compatible with other elements of the established transportation planning process. In fact, several members of the technical team inventing this innovative multimodal planning technique were also under contract to undertake the same important process in support of the California ITMS, which had initially explored a totally different method of creating the California trip table of freight movements and later adopted the Transearch Database.

### *Application of the New Planning Practices*

The results of this path-breaking effort to adapt existing industry-oriented resources to the needs of the public sector allowed Wisconsin to undertake one of the most challenging analyses of multimodal options ever attempted. The WisDOT process married the technical database created by outside consultants with the in-state knowledge base about the details of freight management to examine the potential for the development of a program of better intermodal connections between truck and rail services.

To develop the technical base for this project, the target year base case flows were assigned to modes, including highway, rail, ports, and airports; first for the trends-extended scenario and again for the new truck-rail scenario. The truck-rail scenario was created to determine, in the words of project manager Randall Wade, "to what extent can a truck move become a rail move within Wisconsin's borders." To do this, commodities currently being carried by truck were identified and examined on a commodity basis. The input of the Freight

Expert Panel was then sought, as they individually made estimates about the potential divertability of each commodity.

The process applied the agreed upon modal diversion factors to the flows for each of the commodities. The possible volume of diversions from the scenario was calculated under three different assumptions about the minimum distance for an intermodal trip. If the hypothesized diversions could occur at the 300-mi break point, some 22 million tons would be diverted; if the break point was, in fact, at 500 mi, some 16 million tons would shift; and if the break point was found to be as high as 700 mi, it would result in the diversion of 15 million tons. With these relationships established, the expert panel was asked its view on the viability of the separate break points, and 500 mi was established as the lowest distance at which a carrier would undertake an intermodal operation.

Having agreed on the cutoff point for a feasible operation, the flows were assigned to links of over 500 mi to see which corridors held the “critical mass” of volume that could make such an operation feasible. Frequency was determined to be the key qualifying factor in economic feasibility: the team determined that four trains a day were needed to provide minimized total travel times, with an assumption of 50 trailers needed per train. The market support requirements were superimposed on the map of forecast demand, resulting in the description of corridors susceptible to this kind of increased diversion to rail for a portion of the trip. A process of narrowing was applied (eliminating Wisconsin counties immediately adjacent to existing Twin Cities’ services, for example), and the total tonnage diversion was calculated [Ref. 1-104].

The aggregate trip tables were then assigned back to the network using the Transplan network assignment package, with an O-D trip table created and assigned to truck types based on the nature of their commodity. The result of the intermodal rail scenario was about a 2 percent decrease in overall truck tonnage and an over 2½ percent increase in rail tonnage.

#### *Relationship to Programming*

The analysis of a statewide system of intermodal truck-rail services was undertaken as part of a statewide plan, rather

than as part of STIP or TIP planning process. As of this writing, the concept of developing such a system has been integrated into the statewide plan, and project development activities are progressing. No specific projects have yet reached the stage of programming.

#### *Lessons Learned*

There are similarities and differences between the two statewide innovative practices examined in this chapter. EWITS could be characterized as a research effort, with strong applicability to state decisionmaking, while the Wisconsin effort was carried out by the state as part of the statewide planning process. Consistent with this, EWITS focuses on half of the state, while *TransLinks* covers the whole state. In terms of method, EWITS built its database from a massive scale surveying process of the actual content of the trucks in operation in Washington, while Wisconsin built its database using the resources of the Transearch Database, a proprietary database owned by Reebie Associates. From a methodological point of view, these are very different processes; however, in terms of their use in the planning process, they are largely similar. EWITS was placed into use to examine the possible diversions away from the truck-barge mode in case the Snake-Columbia river system was altered for environmental reasons. The Wisconsin system was placed into use to examine possible diversion from truck-only mode to truck-rail mode.

The key similarity between the innovative planning practices studied is the decision to focus on the commodity needing to be moved and to build the analysis around that understanding, rather than on any aggregation by zone or generalized trip-generation function by geographic area. In Spokane, Puget Sound, and Madison, WI, significant advances have been made to improve the quality of the freight planning process. In each of these independent examples, the strength of the process stems from their attempt to model and analyze the mobility of people and goods and to derive implications about facilities or systems up from those essential building blocks of analysis.



## CHAPTER 4

# MANAGEMENT SYSTEMS AND THE DEVELOPMENT OF MEASURES FOR THE MONITORING OF PERFORMANCE

### INTRODUCTION

Chapter 3 reported that innovative multimodal planning is being undertaken in many locations around the country and is especially applicable in those situations in which a policy-driven question is being asked. In these situations, multimodal planning tools are used to provide information to decisionmakers concerning the public policy issues they have defined as important. In particular, the focus is on the linkage between the policy issue and the tools needed to support the analysis of that issue. This chapter continues the examination of this theme and explores the question of how to reasonably measure the performance of the transportation system relative to these specific policy concerns. This question is explored both in terms of the general status of the system and of the impact of the public policy interventions under consideration.

### OBSERVATIONS

Chapter 4 reviews the results of research on the actual status of the development of programs to monitor “performance” in transportation. This chapter is heavily influenced by the ongoing experience of the Florida DOT (FDOT), which has taken a leadership role in the issues of tying the performance of the system back into the ongoing planning process. The experience of the FDOT will be compared with ongoing work in Oregon and Boston. This chapter is based on four case studies:

- Performance measurement in the FDOT—Efficiency, output, or outcome?;
- Evolution of measures of performance for concurrency determination;
- Development of a multimodal metric of performance for an intermodal terminal; and
- Performance measures for freight within the intermodal management system.

### THEMES

**Measurements must be linked to outcomes.** The measure selected must be carefully linked to the policy question

being examined. This chapter will present a case study of how the application of a measure led to an outcome that was almost the opposite of that intended by the policy-makers.

**Single-mode-based measures are not always the most useful.** With the increasing complexity of the questions being asked of the transportation analyst, the probability decreases that a single-mode-based measure can provide useful answers. This chapter reviews an historically important case study in which an initial formulation of a single-mode measurement was gradually widened and ultimately replaced by a highly integrated multimodal approach.

**Definitions of performance measurement vary.** Examination of the subject of performance measurement is hampered by the fact that several different types of observation are referred to as “performance measurement.” This chapter will review how one state is wrestling with the measurement of *efficiency* and *output* of its agency, the *outcomes* of its acts, with measurement of the *efficiency* of its facilities and the *effectiveness* of its policies. Given that each category of observation has somewhat different requirements from performance measurement, there is considerable confusion in the profession over the meaning of the terms.

### CASE STUDIES

#### Case Study A: Measurement of Performance in the FDOT—Efficiency, Output, or Outcome?

The FDOT provides an exceptional case study for the observation of the status of performance measurement. Few states have gone so far in the explicit commitment to performance monitoring as part of a larger program of accountability. As such, it provides an excellent location for observations concerning what is desirable, and what is really feasible, as viewed by the individuals actually involved in those decisions.

#### Background

In terms of its formal planning process, Florida is committed to fully establishing goals, objectives, and measures

to monitor the degree of achievement of those specific objectives. Toward that end, Florida's 2020 Transportation Plan (March 1995) lists four goals for the state DOT:

- Safe transportation for residents, visitors, and commerce;
- Protection of the public's investment in transportation;
- A statewide interconnected transportation system that enhances Florida's economic competitiveness; and
- Travel choices to ensure mobility, sustain the quality of the environment, preserve community values, and reduce energy consumption [Ref.1-39].

Table 4 summarizes the relationship between goals and objectives in the 2020 plan. FDOT is now developing a strategic plan that serves as a bridge between the higher level of generalization implied in the table and a program to monitor and implement the plan. The March 1995 Draft Strategic Plan provides a good case study for the FDOT staff who are now in the process of transforming this overall document into a program that could be monitored for its "performance."

Florida is clearly committed to the kind of monitoring and feedback process implicit in the ISTEA Management Systems and offers a good case study to see the dilemmas that are raised in the implementation of such a concept. Florida's commitment is stated in the 2020 plan, which notes that after the development of the goals, objectives, and strategies of implementation, . . .

Data and strategies from the management and monitoring systems (such as pavement and bridge conditions on state highways, safety issues, congestion levels and strategies to address them, etc.), measures of performance from those systems and other sources, changes in law and emerging issues will be key elements in revising or extending state transportation goals and objectives in the future years [Ref. 1-39].

In short, Florida is committed to a program of monitoring performance; but, just what that means is currently being debated in Tallahassee.

Florida's Draft Strategic Plan for 1996–2010 provides the reader with a careful explanation of the program of monitoring and feedback in the planning process. As stated in the strategic plan,

Indicators of progress have been created to demonstrate how the Department will measure progress towards each long-range objective. These indicators state what we will monitor during this time frame, such as the rate of motor vehicle crashes, to gauge progress made toward our objective. If our monitoring system indicated that reduction in crashes was not achieved, this will be reflected along with the suspected reason in the annual performance report. Similarly reductions will also be reported. Subsequent versions of this plan will begin the process of turning the indicators of progress into measurable short range objectives, where

appropriate, and will recommend any necessary changes to help better achieve the objective (13).

### *Types of Performance Measurement*

The interviews revealed a significant debate within the DOT staff about just what kind of performance should be monitored. It is a debate that is being mirrored around the country, concerning the difference between monitoring the *efficiency* of the agency, the *output* of the agency, and the *outcome*, which is experienced by the end user.

In Florida, as in Oregon, there is a strong commitment from the executive branch to a program of accountability throughout government. The Draft Strategic Plan notes, "The agency strategic plan format is based on instructions from the Governor's Office." Toward this end, a citizens board has been formed to independently gauge the productivity of the agency. This year the process is adding a customer survey to its evaluation process. But agency managers are quick to point out that, up to now, the "performance" being monitored in this process is the analysis of the efficiency of the agency, largely from a management perspective.

Those involved in the funding process perceive the need to tie the "performance" of programs back to fundamental building blocks of justification. The justification of a program needs to be expressed in a manner sensitive to the needs of the overall budgeter; for example, who is comparing the effectiveness of the highway budget against the effectiveness of the higher education budget. One Florida official argued for the creation of separate performance review procedures. When the legislature authorizes expenditure by budget category, it should get back a level of progress made in that particular dimension. Under the bridge budget, the legislature should be told how many bridges have been built, and how efficiently the agency acted in building those bridges. This implies a closer linkage between measures and budget categories. In effect, the question that has to be answered is, "Did we deliver the work program we said we would deliver?" In response to these pressures to describe the *output* of the dollars spent, the department creates an annual performance report. Up to the present this document has been about the efficiency of the operations of the agency; for example, the number of administrative positions per 100 miles of resurfaced pavement.

But the department now wants to evolve away from these initial measures. According to one senior planning official, they now want to make a transition and "blend" traditional "performance," such as number of lane miles resurfaced with newer concepts, such as level of mobility experienced by the citizens of Florida. The result of this evolution is a serious debate about what is really meant by performance measurement.

One staff member stated the problem succinctly in two important points. First, in her view, transportation expenditures are simply less susceptible to this kind of yearly per-

**TABLE 4 Relationship of goals and objectives in Florida's 2020 plan (1995)**

Safe transportation for residents, visitors, and commerce.	Protection of the public's investment in transportation.	A statewide interconnected transportation system that enhances Florida's economic competitiveness.	Travel choices to ensure mobility, sustain the quality of the environment, preserve community values, and reduce energy consumption.
Reduce the rate of motor vehicle crashes, fatalities and injuries, and bicycle and pedestrian fatalities and injuries on the highway.	Preserve the state highway system.	Place priority on completing the Florida Intrastate System.	Reduce dependency on the single occupancy vehicle.
Improve intermodal safety where modes intersect, such as highways or railroad bridges over waterways and highway-railroad crossings.	Reduce the number of commercial vehicles that exceed legal weight limits on the state highway system.	Complete a statewide high-speed rail system.	Provide accommodations for transit vehicles, bicyclists, and pedestrians wherever appropriate on state highways.
Improve the safety of commercial vehicles rail facilities public transportation vehicles and facilities and airports.	Protect the public investment in aviation, transit, and rail facilities.	Improve major airports, seaports, railroads, and truck facilities to strengthen Florida's position in the global economy.	Increase public transportation ridership.
Improve emergency preparedness and response.		Improve connections between seaports, airports, railroads, and the highway system for efficient interregional movement of people and goods.	Expand public and specialized transportation programs to meet the needs of the transportation disadvantaged.
		Manage and preserve designated transportation corridors in cooperation with local governments and through advance acquisition of right of way.	Minimize the impact of transportation facilities and services on the environment.
			Increase energy conservation and use of recycled materials, native vegetation, and wildflowers.

formance measurement than are other programs with more direct causal relationship to programmatic impact; second, she believes that measurement of performance is here to stay, and there is no way that the transportation community can resist it or refuse to participate in it. Other staff members involved in the development of the monitoring and evaluation strongly supported both of her observations. A public program to raise reading scores in schools, for example, has an obvious metric of the success or failure of its performance. On the other hand, it was argued that the impacts of transportation often take decades to develop to a measurable extent, and even then, the impacts may be best gauged through some other phenomenon, such as land use change.

To many in the Florida program, the issue of reporting back on "performance" is not a simple or clear-cut one. Several officials interviewed for this project used the first 2020 plan's goal as a working example of their concern. The goal, shown in Table 4, is "safe transportation for residents, visitors, and commerce." At the time of the interviews, the staff was preparing a strategic plan that, for each objective, reviews programs underway, monitors recent trends and conditions, and proposes "indicators of progress" as performance measures. Several caveats were mentioned concerning the objective, "reduce the rate of motor vehicle crashes, fatalities and injuries, and bicycle and pedestrian fatalities and injuries on highways." First, the FDOT is not responsible for some 90 percent of the road miles in the state, which rad-

ically limits the amount of impact a state-managed policy can have. In addition most accidents are associated with factors not influenced by a DOT program, such as driver error or poor vehicle maintenance.

The department is committed to the program of monitoring system performance, and the performance report will include the statewide crash rate, death rate, and pedestrian fatalities. What is less clear to these planners is whether there is any relationship between the policies of the DOT and the fluctuations in these indices of “system performance.” The commitment is there to monitor the performance of the system. “We are tracking these,” said one state planning official, “although we do not claim that our policies have changed these. Ideally, all of these would become outcome oriented, but we haven’t been able to come up with such a program of measurement.”

Another planning official in Florida questioned whether it was methodologically honest to report *outcomes* in the program evaluation process. The *output* of the agency, he argues, can be quantitatively described in terms of the relevant objective, while the *outcome* of those actions often cannot. For example, an “indicator of progress” under the objective of intermodal safety might be the number of grade crossing improvements built in one year, rather than the actual accident rate over the state’s grade crossings. If public policy asks for an increased emphasis on bridge safety, he argues that the measure should be the portion of the total bridge budget allocated to improvements categorized as safety oriented. On the other hand, a given *outcome* (e.g., a lowered collision rate) may or may not be attributable to the acts of the agency.

### *Lessons Learned*

To these practitioners it is not clear whether the “outcomes” (e.g., number of people killed on bridges) should be emphasized more than “output” (e.g., number of unsafe bridges upgraded). At the same time, there was general agreement that the management efficiency of the agency should not be utilized as a measure of the performance in relation to the objectives specified in the planning process. The important point for this report is that the concepts are being carefully examined by working practitioners trying to make the concept of performance measurement operative. Florida’s experience with the concept of measurement provides an unparalleled opportunity to understand the challenges, dilemmas, and ambiguity associated with undertaking such an ambitious process of accountability.

To better understand the role of performance measures in the management systems, it is best to turn away from the issues of measurement in support of budgeting and long-term plan objectives and look at a case study on the use of measurement in support of an externally defined policy context. To do this, the role of performance measurement in relation to the administration of statewide growth management pol-

icy in Florida will be examined. This, in turn, provides a solid background to help understand Florida’s continuing commitment to the development of locally defined Congestion Management Systems (CMS).

### **Case Study B: Evolution of Measures of Performance for Concurrency Determination**

As discussed in Chapter 3, the tools of multimodal planning are becoming more critical because of the wide variety of public purpose demands that are being placed on the transportation planner. In terms of the development of performance measurement, the advent of policy-driven planning, as opposed to facility-driven planning, increases the need for the careful selection of performance measures to support the decisions that need to be made. Florida provides an excellent case study in the selection of appropriate performance measures and the revealed need to evolve away from single-mode measures toward measures that can be applied in the multimodal environment. In the project interviews, Florida officials explained the history of the use of LOS as the selected performance measure used in the application of “concurrency review” as part of the state’s growth management strategy; further, the case study reveals Florida’s present strong commitment to the concept of locally developed CMS.

### *Background*

In the mid 1980s, the development of Florida was occurring at a breakneck speed—between 1970 and the present time the population has doubled. In reaction to this accelerated development process, according to seasoned observers of Florida’s planning process, many became concerned that developers of new projects were creating massive demands on existing infrastructure, which had to be provided by the existing governments and the existing residents. The logic of growth management legislation was clear: the infrastructure needs to be in place *concurrently* with opening of the new development, which became known as the finding of concurrency.

### *Initial Selection of a Measure of Performance*

The Florida Department of Community Affairs was charged with establishing the rules for the finding of concurrency and took the position that the LOS standards accepted by the DOT for highway performance should apply throughout the roadway system. In this application, the developer contributing to an LOS F condition would be denied permission to build, while a developer contributing to an LOS B would be allowed to proceed. Many have argued that the results stemming from the selection of this particular perfor-

mance measure were the opposite of what had been desired in terms of growth management. A well-respected study (Bricka et al.) noted

One outcome of the 1989 standards was the encouragement of fringe development, where there tended to be more available capacity. Thus, as reasonable as the approach of the 1989 standards appeared, it became generally accepted that leapfrog sprawl-type development was actually encouraged [Ref. 3-177].

From the point of view of growth management, exurban areas—those with the least resources in terms of water, sewers, and schools—were targeted as the best locations for growth stemming from the application of the originally conceived performance measure. The weakness of the sole reliance on that measure of performance was noted by Ewing, who wrote . . .

Florida, a leader in growth management has already concluded the indiscriminating reliance on roadway Level-of-Service measures has been driving the land development process in unwanted directions, including urban sprawl and has revamped its regulations and transportation measurement requirement in hopes of rectifying the problem [Ref. 3-211].

#### *Revisions to the Initial Performance Measure*

With further iteration of the idea of concurrency, standards were applied that acknowledged different standards by functional classification, with urban areas being rated differently than exurban areas. Thus, in the city, LOS E might be considered acceptable while in the exurban area, LOS C was needed to allow the development to occur. But, with the establishment of stringent standards in the exurban areas, it became more difficult for the local governments to approve the development desired to increase the tax base. One by one, counties began realizing that they could not build enough highway capacity to support the LOS required by the regulations. From the point of view of several officials interviewed, the result was a continuing process of loosening the performance requirements.

To deal with the concurrency law, LOS was reinterpreted not to refer to a given roadway segment but to apply to “an areawide level of service,” assuming that there was excess capacity on other portions of the system. For a variety of reasons, the Department of Community Affairs approved this new concept of an LOS for an area rather than for a roadway link or segment. During this phase of evolution of the performance measurement program, the fundamental concept of some definition of volume divided by some definition of capacity was retained. The new pattern of examining the average capacity of an area, rather than for a link, encouraged other areas to argue for similar variations to facilitate approval of development plans. Urban areas responded that transit capacity (including unused seats on buses, etc.) should

be used in the calculation of the area’s capacity and its implicit level of services. The result is that development around high-capacity transit service could be approved even when the roadways were at LOS F. Each type of area had devised ways to loosen the impacts of the concurrency regulations, making their usefulness somewhat questionable in the view of those interviewed.

#### *Development of the CMS Approach*

By 1993, the political process had determined that a major rethinking of the growth management regulations was appropriate. In a process called Environmental Land Management System (ELMS 3), 40 citizens worked on revising the approach to growth management. ELMS proposed to significantly alter the concurrency approach, which was not working. The new system required that the Department of Community Affairs approvals be contingent on the preparation of a locally prepared Transportation Concurrency Management Area. Within these areas, the local governments could establish their own rules to encourage sound transportation management programs.

In the view of the Florida transportation officials, several good things did develop out of this difficult process. They argued that the concurrency process was, in some ways, an incubator for the development of performance measurement. For whatever motivation, the concurrency experience led policymakers to understand the importance of multimodal measures and indices. As a result of the process, regions and local governments were asked to understand the transportation implications of their land development policies, and the art of performance evaluation benefited from this experience. In the revised process, ELMS encouraged the development of locally based management strategies. Florida law established that all urbanized areas over 50,000 (including Florida’s somewhat unique developments outside of established urban governments) had to develop, what is, in effect, a CMS.

Some state DOT members worry about the lack of comparability that stems from local adoption of their own terms of monitoring. One staff member compared Florida to “a ship of state with a broad aft section, with many rudders to steer.” He worried that this vision of the state is driven by 457 separate plans. But, as others noted, the emphasis on local control of the management process encourages accountability, a key aspect of ISTEA planning.

#### *Congestion Management Systems in Florida*

Because of the concurrency experience, Florida is developing state-of-the-art approaches to the measurement in the context of the CMS and in the context of the IMS. Within these constructs, Florida is developing refined approaches to system measurement. The present CMS calls for local strate-

gies. Senior officials at FDOT believe that they have encouraged the local MPOs to develop their own rules and their own strategies, particularly in terms of the investment in local arterials and other investments outside of the state system. In this view, a locally managed CMS is very healthy as it anchors the short-term planning process, grounding it in existing conditions and calling for the monitoring of those conditions. As such, it ties planning back to present-oriented data.

The case of Orange County is an example of this evolution. Although the expected rate of growth would have required a widening of six-lane roads to eight lanes, Orange County worked with FDOT to pursue “a broader more strategic approach to congestion management that includes land use strategies, transportation demand management and transit alternatives.” As part of this initiative, the county has developed a “strategic development plan for activity centers, (which) targets transit service to and from activity centers and includes a circulation strategy that integrates pedestrian and various other modes of transportation. The objective is to obtain an internal trip capture rate of 30%.” [Ref. 3-177]

The revised state system, then, has turned away from the application of one uniform measure of performance and called for the use of locally defined creative strategies. In the city of Orlando, those strategies will depend on the sensitive application of innovative multimodal planning techniques that incorporate land use considerations, transit considerations, and the trade-off between motorized and nonmotorized trip making.

Largely freed from the task of approving or disapproving specific development proposals, the local CMS can turn to measuring the adequacy of the system to serve the needs of the users, rather than focus on the characteristics of the facilities. This suggests the need for development of user-based measures, rather than facility-based measures. By way of example, San Francisco found that between 1980 and 1990 the number of miles of congested freeways had increased by 66 percent. At the same time, the average reported travel time for the journey to work had increased by about one minute. When viewed through the lens of the facility, a catastrophic breakdown of the system might be implied. When viewed through the lens of the user, the daily experience of the trip to work had hardly changed at all [Ref. 3-104].

The managers of the CMS process are now free to explore the key issues of measurement and evaluation. One manager of the Florida CMS process stated that their efforts will not reduce congestion but rather address and improve mobility. Mobility, in this view, is the ability to complete the desired trip: this could be done by telephone, by bus, or by some act that eliminates the need for the trip entirely. State managers have made the decision that the local CMS efforts must measure “mobility” but have yet to establish just what would comprise an accepted measure of mobility. In their early thoughts, such a measure of mobility might be a composite of highway travel times, bus schedules, and the number of miles of bike paths. The FDOT has encouraged Gainesville

and Broward County/Fort Lauderdale to come up with mobility measures for inclusion in their CMS efforts. Concerning the use of volume/capacity (V/C), they believe that highway LOS is valuable as a “flag” to warn of a broader based failure of the system, at which point more policy-sensitive indices should be placed into play. As an ultimate direction, a key manager believes that “persons times speed” holds promise. (By way of comparison, California’s ITMS uses a mobility measure based on average vehicle occupancy times change in speed, a construct quite similar to that being considered in Florida.)

### *Lessons Learned*

In the study of transportation performance measurement in the concurrency process, there are three distinct phases. In the first phase, the sole evaluative measure was LOS, a single-mode unit of measurement, applied consistently over the roadways of the state. In the second phase, the fundamental metaphor of volume over capacity was retained as the appropriate metric for evaluation, with the definition of capacity widened first to other roads in the network and then to include transit. With the third phase, the simple application of volume over capacity was challenged and replaced (in some cases) with a wider process that more truly reflects the appropriate scope of multimodal planning techniques.

This Florida case study provides a solid base for observing the importance of the *linkage between the performance measure and the policy issue to be resolved*. Several Florida leaders interviewed suggested that transportation analysis was a poor basis on which to make the land use impact decisions in the first place. Other issues, such as the adequacy of water, sewers, and schools, proved to be more relevant to the determination of the desirability of the development. The result was that the understaffed resources in the Department of Community Affairs focused their finite resources on the issues they felt were most relevant. Thus, the measure chosen was not the most appropriate to support the decisions that had to be made.

In addition, this experience in the area of performance monitoring in support of policy-driven planning provides a working example of how *a single-mode measure of performance had to be replaced by a procedure that would use truly multimodal procedures*, including the use of multimodal measures in place of single-mode measures. Simply stated, the application of the oversimplified measure led to undesired policy outcome, with its encouragement of “leap frog” exurban development. It might be argued that LOS was selected as the sole performance measure for urban growth management for the basic reason that, in 1985, LOS was the *only* performance measure in general use for the evaluation of transportation. It can also be argued that the application of the measure in this manner accomplished almost exactly the opposite of what it was intended to do.

### Case Study C: Development of a Multimodal Metric of Performance for an Intermodal Terminal

Several NCHRP 8-32 projects have reviewed the progress of many planning organizations in the development of performance measures that directly support locally defined policy decisions and can be used in a cost-effective manner. Even in areas like Florida and Oregon, where state-based direction has established the process of monitoring performance into legal statute, the development of new measures has still been quite slow. In Portland, the MPO director said that some 157 measures were presently under consideration, but it was too early to discuss their applicability. In FDOT, the project team was told that “mobility” is the centerpiece of the CMS strategy, but it was too early to agree on a measure that would be used to monitor it. A rare example of a metric of performance evaluation that was created in response to a local policy concern is the Massachusetts Port Authority’s technique of evaluation for ground access strategies for Logan International Airport. A computerized review of the NCHRP 8-32 Project Database shows that this is one of the very few performance measures actively promoted by its host agency, as exemplified by its presentation at the 1994 TRB Conference on Intermodalism [Ref. 7-3].

#### Background

The problems of ground access to Boston’s Logan International Airport have long received high levels of policy attention in the commonwealth of Massachusetts. First, political opposition to the expansion of the airport has often been based on the environmental impacts experienced by the immediately adjacent neighborhoods. Second, several billion dollars were being spent to extend Interstate 90 (the Massachusetts Turnpike) to Logan International Airport. The lack of highway access, over several decades, had produced a situation in which the percentage of passengers arriving at the airport by public modes was steadily increasing. Environmental analysis undertaken to document the impacts of the new highway revealed a possible outcome of considerably increased vehicle miles of travel (VMT) to the airport as a result of the reinstatement of available highway capacity.

#### Need for a Metric of Evaluation

With the highly visible addition of a \$3 billion highway, doubling effective cross harbor highway capacity to the airport, environmental groups became increasingly concerned about the number of VMT being generated by the airport. Implicitly, their acceptance of a massive increase in roadway capacity was linked to the creation of a program to control

VMT growth associated with the airport. At the same time as the concern for air quality impacts of transportation surfaced, there also was an acknowledgment of the importance of the airport to the regional economy. Thus, there was little or no movement to “cap” the VMT and constrain the mobility of the region. The challenge was to create a measurement of system performance.

#### Early Attempts at Performance Evaluation

For more than a decade, the agencies had been monitoring the use of public transportation modes to Logan International Airport. In the late 1960s and early 1970s, policy attention was focused on the number of passengers who arrived by rail rapid transit. As the airport agency became more involved in its own environmental documentation, the policy attention shifted to the combination of those arriving by rail and by rubber-tired services such as buses, jitneys, and limousines. Throughout the environmental analyses of the 1980s, policy attention was focused on the issue of maximizing total travel by public modes.

Not satisfied with existing procedures for performance monitoring and feedback, a local environmental group entered into a legal contract with the Port Authority in which the Authority committed itself to a program of yearly monitoring at a level of detail that would allow a reasonable simulation of VMT to be calculated, both for the documentation of empirical conditions and for use in the analysis of possible candidate policies and strategies. In effect, the policy concern shifted from total number of persons by public mode to the minimization of total VMT generated by access to the airport. All public policies that influenced VMT, not just those which increase public modes, were now on the table for monitoring and analysis.

#### Selected Metric of Evaluation: “Vehicle Trips Per Airline Trip”

Just as the Oregon benchmarks established a concept of VMT reduction *per person*, the Massport metric of evaluation is based on the ground vehicle trips created *per airline passenger*. To evaluate the implications of public policy shifts between modes, Massport calculated the number of vehicular trips per passenger at the airport for all ground access modes, including variations within the automobile access mode, specifically differentiating between pick up/drop off mode and drive/park mode. A candidate policy or action can then be evaluated with the performance measure “average vehicle trips per passenger trip.” The values for each mode are presented in Table 5.

Having arranged the data in this manner, Massport has developed a short-cut method of observing the VMT impacts of a given policy action or investment. If a given action

**TABLE 5 Metric evaluation for ground access to Boston Logan Airport [Ref. 7–3]**

Mode of Airport Access	Ratio
Pick Up/Drop Off	1.29 Vehicle trips per passenger trip
Taxi	1.09 Vehicle trips per passenger trip
Drive/Park	0.74 Vehicle trips per passenger trip
Rental Car	0.69 Vehicle trips per passenger trip
Door-to-Door Shuttle Van	0.33 Vehicle trips per passenger trip
Scheduled Bus	0.10 Vehicle trips per passenger trip
Rapid Transit	0.00 Vehicle trips per passenger trip

results in an overall decrease in ground trips per airline trip, it is considered to be an improvement. If a given action results in an increase in ground trips per airline passenger trip, it is considered to be a degradation of conditions. As phrased by Massport officials, if a change of mode moves a given air passenger down the scale of Table 5, it is considered to be positive; if a change of mode for a given passenger moves them up the scale, it is considered negative. For example, if a given passenger shifts from taxi mode to drive-park mode, it is considered positive. If a given passenger moves from taxi mode to drop-off mode, it is considered negative.

The implications of this truly multimodal form of measurement may not be immediately obvious; for example, it might seem self-evident that moving users away from automobiles to rail will result in lowered vehicle trips per passenger. But because the evaluation scheme is truly multimodal in nature, it shows the importance of differences *within* the automobile mode in addition to differences *between* the automobile mode and the public modes.

The program of monitoring allows Massport to analyze the number of vehicle trips generated by each mode of access. Application of this monitored data shows the power of the data organized in this manner. For example, the research shows that 19,800 vehicle trips (over 40 percent of trips at the airport) are attributable to pick up/drop off mode. Clearly a public policy that has the effect of diverting a given percentage of travelers away from this mode would have more impact on trip minimization than any other strategy because of the absolute volume of trips and because each pick up/drop off rider is associated with higher levels of vehicle trips per airline trips. A mode-specific evaluative framework, which asks how many trips happened by rail or how many trips by all public modes, might not have even registered the powerful effects of mode shifts within the automobile modes.

### *Lessons Learned*

First, the development of the multimodal metric of performance for ground transportation options by Massport under-

lines again the importance of linking the measure of performance carefully to the right formulation of the policy question being addressed. Use of even the most accepted summary indices, such as average vehicle occupancy, may be inappropriate, depending on the specific setting that is being analyzed. For example, the use of average automobile occupancy might encourage the users of the pick up/drop off mode, rather than discourage them.

Second, the measure is focused on the decision options of the actual user, rather than on the characteristics of the flows on a facility. As such, it is available for use with market-driven tools, including elasticities with respect to change in cost and travel characteristics. Focusing on the end decisions about the user, the measure is truly “modally blind” and can be used to examine the implications of change in parking rates or an improvement in the headways of the rail system. Rather than gauging the success of rail line or of a roadway link, it allows for a truly multimodal evaluation of the results of the decisions of the end user.

Finally, it is a rare example of the successful use of *outcomes* rather than agency *output* or system *efficiency*. Quite simply, not many agencies can afford the recurrent surveying and monitoring that Massport committed to the local environmental group. With the constant surveying of actual conditions on each of the modes, Massport is in the rare situation of being able to “track” the actual outcomes of the policy interventions undertaken.

### **Case Study D: Performance Measures for Freight Within the Intermodal Management System**

A current problem with the study of measurement of performance in transportation stems from the breadth of subjects covered under the concept of “performance.” This chapter has reviewed the concept of performance as it relates to the management *efficiency* of an agency, the quantifiable *output* of the agency, the efficiencies of the system operations, and the *outcome* experienced by the end user. The concluding section of this chapter will explore the concept of the measurement of performance of freight, par-



ticularly within the context of the IMS. Interestingly, several states are finding that the commencement of the IMS process is so complex and requires so much original work that the desired focus on the *effectiveness* as experienced by the user may not be feasible in the near term; and that, in fact, what may be needed are localized examinations of the efficiency of facilities and points of interconnection between facilities.

The Oregon DOT, like many other agencies dealing with the challenges of IMS, has been wrestling with the difference between an emphasis on systemwide performance and an examination of the quality of linkages to and from major points of intermodal interconnection. Like Florida, the managers of Oregon's IMS are departing from an initial policy orientation to observe the quality of the full system and are initially taking on the more manageable task of documenting the quality of connections from the points of intermodal interconnection back to the trunk (or mainline) elements of the transportation system.

### *Background*

One of the most comprehensive reviews of candidate freight performance measures has been underway for several years under the leadership of the Oregon DOT, which is sharing the responsibility of developing the IMS with the port of Portland and Portland Metro. During 1993 and 1994, the joint team undertook an extensive review of possible approaches. In 1995, its IMS implementation study proceeded with the development of the system.

### *Evolution of Measures Examined in the Oregon IMS*

Like many other states in their initial examination of the potential role of IMS for freight and passenger, the early expectation was that the quality of the total system, or the quality of the trip experience by the end user, could be modeled and analyzed in the process. The following list of possible performance measures under consideration in late 1993 reveals a policy interest in focusing the procedure on these systemwide levels of monitoring and evaluation. In the 1993 drafts of scoping for the IMS, Oregon listed five areas for performance measurement:

- *Cost*, measured as cost per trip or cost per ton mile from the producer to the user;
- *Time*, measured as average travel time per trip from the producer to the user;
- *Accessibility*, measured as capacity restrictions, average transfer time between modes, perceived deficiencies, and services availability;
- *Reliability*, measured as delay per VMT, LOS for intermodal facilities, and public perception; and

- *Safety*, measured as average accident-caused delay per trip, average accident cost per trip, number of accidents per trip, number of accidents per year, number of accidents per VMT, and/or some measure of personal safety at terminals (14).

Most of these measures describe the performance of a system, often as experienced by the end user. The examinations of cost and time were specifically spelled out as the full cost and time *from the producer to the user*. By comparison, Florida initially set out on a very similar, systemwide approach. Florida, which had received federal funding to do pilot work in this area, set out on a two-level strategy. At once, they planned to set in motion a statewide freight monitoring program that would produce total times and total costs of shipment from producer to shipper on a statewide basis. Because of imminent deadlines from the originally specified timing of the management systems, Florida created a process called "Pre-IMS Strategies and Actions," which was originally intended as a short term fill-in before the larger program could come into service. That program was to affect decision makers around the country because it was the first to propose a facility-by-facility approach. Under this concept, the "performance" of the full intermodal system would be determined first by undertaking a careful analysis of the points of intermodal interconnection in the system, specifically airports, seaports, passenger terminals, and freight distribution points.

### *Revised Orientation of Data Collection in the Oregon IMS*

Like many states, Oregon has now chosen to focus its attention on the points of interconnection within the system and to build its systemwide observations up from the information collected in these essential building blocks of data collection and analysis. In 1996, the Oregon team worked to refine a small set of performance measures for use in the IMS. According to the managers of the process, they want to develop no more than 15 measures for the freight side and 15 for the passenger side. The concept under development is to collect information on the performance of individual facilities (points of interconnection). For those facilities, data will be collected concerning capacity, accessibility, connectivity, time delay, and safety. The matrix of performance monitoring is shown in Table 6.

In general, the performance of the facility is monitored for its condition *per se* and then for the quality of its links to the modes that connect it back to rest of the transportation system. The following are examples of the kinds of measures that might be used in the cells of the matrix:

- *Capacity* of the facility and the capacity of the linkage might be expressed both in absolute terms and in terms of percent of capacity being used.

**TABLE 6 Draft format for Oregon's IMS data collection for freight facilities (1996)**

		Capacity		Connectivity	Time Delay	Safety
Characteristics of the facility under study						
Characteristics of the facility's link to:	Truck					
	Rail					
	Ship					

- *Accessibility* of the facility might concern the service level of the connecting mode to the facility under examination.
- *Connectivity* of the facility itself deals with evaluating the location of the facility with respect to mainline facilities. Connectivity of the linkage might simply document whether a particular modal connection exists. (In previous work efforts in Oregon, this area of measurement was labeled "availability.")
- *Safety* of the facility itself might be expressed as a ratio of the accident rate at that facility to the industrywide accident rate for such facilities.

Also in Oregon, there is a debate about the concept of performance measurement. "In ODOT we are not allowed to get bored with performance! We are struggling in the development of performance measures," explained one state official. Oregon's central government, like Florida, has determined that its agencies shall monitor the effects of what they do and incorporate performance measurement into major policy formation, such as capital prioritization. And, as in Florida, carrying out the ambitious program is proving more difficult than conceptualizing it.

"We have to deal with the expectation that the management system will automatically give up priorities," said one state official. To him, this represents "a big misunderstanding of the management system. *The connector roads, the rail connectors—these are the things we should be examining.*" In the judgment of this manager, the best way to start measuring the performance of the system is by understanding the quality of the linkage between key facilities and the rest of the transportation system.

Similarly, Florida is now carrying out a program of analysis largely consistent with the proposals of the earlier "Pre-IMS Strategies and Actions" document. They are now in the process of learning about performance deficiencies at intermodal points of connection. The statewide IMS program will reevaluate 70 facilities annually and note the progress being made to deal with the revealed deficiencies. In essence, it is a statewide program of evaluating the transportation adequacy or deficiency at 70 localized locations, not a statewide program evaluation of *outcome* as experienced by the end user. This is important because the present program grew out of an earlier policy intention to build a program of statewide, user-oriented monitoring.

The IMS program has created three separate facility evaluation sheets: one for passenger facilities, a second for freight, and a third for joint use facilities. For each of the three facility categories, three types of information are collected: (1) inventory characteristics, (2) accessibility/transferability, and (3) safety. At present, the program is being implemented statewide. This form of facility-by-facility review, which emphasizes the accessibility to and from the major links of the system, parallels directly the process undertaken in Oregon. Daytona was selected as the pilot area for testing in mid-1995, and the program for the collection of data to support the analysis of deficiency was started. Early feedback from the process led IMS managers to add transfer time to the form.

Florida's schedule calls for the IMS data to be available for use in the preparation of TIPs. "We will make a summary of the deficiencies," explained the project manager in Tallahassee. "We [in the central office] will not make recommendations as to what to do; we will give them to the districts, and they will decide what to do." Florida has developed an intermodal project fund, which is partly based on a formula allocation, and partly discretionary. The IMS team will supply them with the data collected from the deficiency analysis. Armed with this data, the districts will make proposals, and a statewide committee will determine the distribution of the discretionary funds. Consistent with the direction taken in Oregon, the Florida IMS is not asked to, or will it attempt to, make decisions on capital prioritization.

### *Lessons Learned*

The Oregon IMS is examining the points of intermodal connection, documenting the quality of linkage to the other modes of the system. In several cases, states initially responded to the interim final ISTEA regulations by hiring consultants to develop long lists of possible measures and analyses of the data requirements. Several states have responded to this initial phase of inquiry into performance measures by backing off from the long list of measures and replacing them with a short list of policy-sensitive considerations. In many cases, the written word has replaced initial attempts at summary quantification. Answers to "Do trucks have difficulty getting into the freight distribution center?" have replaced measures like "Average cost per ton/mile by

commodity.” In one Midwestern state, the highest priority performance measure in the state IMS is an answer to “Do you feel safe waiting for the bus?” At first, this may seem to be a direction that is inconsistent with the intent of the regulations; however, several of the practitioners interviewed argued that it was desirable to implement performance measurement in a manner closely linked to the attainment of understandable policy objectives, and that, in fact, this trend of more direct, local observation was helping this to occur.

In this brief review of the innovative planning practices for the measurement of intermodal freight conditions in

Oregon, the direction being taken in the observation of the “performance” of freight has shifted away from highly aggregate summaries of corridorwide or systemwide performance and toward the observation about the qualities experienced on a more understandable scale, the scale of the facility or the point of interconnection itself. In the conclusion of several states, questions concerning the effectiveness of the entire system need to be answered, but to do that, decisionmakers need to gain a better understanding of localized conditions that affect that systemwide performance.

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## CHAPTER 5

# INNOVATIVE METHODS OF PUBLIC INVOLVEMENT

### INTRODUCTION

The ISTEA of 1991 requires states and MPOs to provide reasonable opportunity for comment at key stages of the transportation planning and programming processes. The implementing regulations, issued jointly by the FHWA and FTA, require preparation of a public involvement plan to ensure effective opportunity for public input by citizens, affected public agencies, representatives of transportation agency employees, private providers of transportation, and other interests.

While public participation has been stressed in prior FHWA and FTA planning regulations, ISTEA's requirements are new and represent a statutory emphasis on public input for the first time. This chapter looks at recent examples of innovative public involvement practices that have potential for application in other state and metropolitan areas.

### OBSERVATIONS

Many new approaches to engage the public's interest in transportation were evident from the phase one research described in Chapter 1. The project team found considerable evidence that ISTEA and certain state policy initiatives have both fostered more comprehensive approaches to public involvement and promoted a wide range of experimentation among transportation agencies. For example, Wisconsin DOT's approach to gauging public willingness to finance planned projects is especially instructive on methods of producing a realistic plan. In St. Louis, the outreach process for the MPO long-range plan included high-quality process publications and a wide range of techniques to engage the public. The public involvement effort in St. Louis continues from the long-range plan process through the implementation of strategies. Indeed public involvement is such a critical component in the development of post-ISTEA projects that this report references a number of successful examples and their impact on various aspects of the planning process in other chapters. (See Chapter 6 on rural planning practices.)

Potential case studies were screened using the evaluation criteria determined during phase one. At the conclusion of

that phase, the project team selected examples of highly innovative public participation activities in Boise's MPO, St. Louis' MPO, and the Wisconsin DOT. Subsequently, it was determined that the Wisconsin DOT *TransLinks 21* process had been extensively documented by other researchers, including in this report (Chapter 7). Thus, the team chose to include Maine's new citizen-based regional planning process, because of its unique links to program implementation, rather than *TransLinks 21*.

### THEMES

From an examination of recent experience of transportation agencies in implementing public participation programs, including the case studies described in this chapter, four themes are evident.

**The ISTEA requirements for public participation have stimulated many new approaches toward involving the public in transportation planning and programming processes.** In interviews with states and MPOs on other planning issues for this project, the project team found numerous examples of innovative methods of opening up the planning process to other agencies, modal interests, and the general public. The three examples chosen for this chapter represent highly creative approaches to the public involvement challenge. Although each case study has unique features, their examples offer relevant lessons for other agencies on the effectiveness of individual participation techniques and on the larger question of how effective public participation is as a tool of multimodal planning.

**Early efforts to involve the public in the planning process are important to the credibility and acceptance of the plan.** The old method of waiting until the draft environmental impact statement (EIS) was ready on a project has led to cynicism about the planning process in some communities. Letting the public in on the ground floor where transportation issues and needs are determined before projects are defined builds support for the program and can improve the chances of implementing plans and projects. The importance of this theme can be seen in the cases described in this chapter, and it is reemphasized in the examples described in Chapter 6.

**Continuing public involvement in implementation of the plan's proposals increases the likelihood of plans moving from paper to structure and services.** Here, "a new way of doing business with the public" is discerned in a number of the agencies where interviews were conducted. Instead of shutting the door after the plan is developed, the project team found many examples of advisory committees helping to implement strategies and programs identified in the planning process. In Maine, for example, new regional planning bodies are evaluating transportation demand management proposals for implementation by the state DOT.

**Using several different methods and venues for engaging the public increases the chances of involving the typically "uninvolved."** In the review of recent practices, a number of experiments were focused on how to bring new individuals and groups to the planning table. For example, some MPOs and state DOTs are using focus groups on particular issues and seeking the help of agencies in other areas, such as environmental and human services, to build mailing lists to reach new groups. Among this group of experiments, the team found the efforts of the Ada Planning Association in Boise and the East-West Gateway Coordinating Council in St. Louis especially innovative and successful.

In addition to these four predominant themes, the East-West Gateway Coordinating Council's highly innovative public involvement efforts demonstrate the value of a regional agency in supporting the efforts of local agencies to define and deliver needed services. The council's unusual measures to engage local agencies in meeting transportation needs represents a true redefinition of a planning agency's role. It also gives "partnership" a new meaning.

## CASE STUDIES

### **Case Study A: Public Involvement as the First Step in Redefining Transportation in the St. Louis Region**

#### *Background*

In 1992, the East-West Gateway Coordinating Council undertook a highly participatory process to develop its long-range plan. The council serves as both a comprehensive council of governments (COG) and the MPO for the metropolitan St. Louis and East St. Louis areas. As a COG, the council has responsibility for planning and coordination in many areas, including economic development, environment, and social services, in addition to its role as the MPO. This larger role was used to an advantage in identifying members of a broad-based steering committee for the long-range transportation planning effort, and later in bringing many other new players into the process.

#### *Finding New Voices and Views*

As one means to broaden the base of citizens involved, the council created three coordinated committees to advise the steering committee at key stages of the process. The committees involved some 200 persons and were organized around three major areas of concern:

- *Land use and environment* to include representatives of environmental, development, and real estate interests;
- *Employment and community services* to include low-income residents and those in need of social services; and
- *Regional economy* to include business and financial interests.

The committees' work was supplemented by focus groups to gain better insight on ways of linking disadvantaged people and employment, air quality concerns, and transportation security. To inform as wide a public as possible about the planning process, the council supported an extensive public relations campaign with regular topical newsletters, public service messages, and special publications. In this latter category, there was a reader-friendly transportation guide called *Talking the Talk* that, like other aspects of the public information effort, was designed to make the planning process understandable to average citizens.

#### *New Issues Become Important*

The result of this carefully crafted public involvement program is a regional plan, *Transportation Redefined*, that has seven defined focus areas for implementation activities, including traditional capital improvements as well as management and service initiatives. As an example of the new types of transportation concerns addressed in the plan, one focus area is removing transportation barriers faced by residents of older communities in the metro region. This and several related issues were identified early in the planning process through careful analysis of area demographics and were refined through the inclusion of the transportation disadvantaged in the plan's development. As noted in the progress report one year after the plan's adoption:

Focusing on improved access to employment opportunity for these customers of the region's transportation system requires breaking new ground: communication, innovation, cooperation, and ongoing evaluation are needed in a special kind of project planning and implementation process which differs significantly from past capacity-based project development techniques (15).

### *Plans Leading to Implementation*

Since approval of the plan in late 1994, the council has maintained its commitment to public involvement through its approach to implementing programs to address these priority areas. In taking on the issue of transportation barriers, the council engaged the energy and resources of over 60 agencies and community groups. Through this highly collaborative effort, five community mobility initiatives were underway in specified target areas within a year of the plan's adoption. These initiatives are multidisciplinary responses to transportation needs defined by the users, which incorporate multiple modes, services, and sources of financing. Here, transportation is the means to the end of increasing a community's access to jobs, health care, and other basic services.

### *Organizational Role and Structure Offers Advantage*

In developing *Transportation Redefined*, the council's role as a comprehensive planning organization offered an important advantage over other transportation planning agencies. In both the plan's development and implementation, the council involved staff from several of its departments in addition to the MPO. By crossing program lines, the council was able to link transportation planning to other community issues and needs. Starting with developing contact lists for the three committees, this in-depth knowledge of nontransportation agencies gave the council a head start on broadening the transportation planning process to include new participants and ideas. For MPOs and other transportation agencies, this same level of expertise can be obtained only from active partnerships with sister agencies at the state or local level, which may be more difficult to accomplish. While such partnerships are not common, the Partnership Program of the MTC in the San Francisco Bay Area and the Delaware state planning initiative also are characterized by this agency partnership approach.

### **Case Study B: Citizens Bring Multimodal Issues to the Table in Maine**

#### *Background*

A few weeks prior to the adoption of ISTEA, Maine voters passed a unique referendum on transportation policy that mandated multimodal planning in the state and emphasized road repair over new construction. The referendum grew out of a controversy surrounding the proposed widening of a 30-mi section of the Maine Turnpike. The Maine voter referendum is a prime example of forces outside the traditional planning community defining a policy problem, a key finding of the research as described in Chapter 3. Among other requirements, the Sensible Transportation Policy directed:

- A state DOT and Maine Turnpike Authority (MTA) evaluation of the full range of alternatives to highway construction and reconstruction;
- Establishment of a public participation process for municipal and citizen involvement in transportation planning and decisionmaking; and
- Use of energy-efficient forms of transportation and avoidance of transportation modes reliant on foreign oil.

### *Maine DOT (MDOT) and Citizens Design the Process*

In its first effort at public involvement under the policy, MDOT and MTA entered into a negotiated rule process that involved almost 60 organizations, including representatives of several state agencies, towns, modal advocacy groups, environmental organizations, chambers of commerce, the construction industry, and labor (16). Despite the controversy surrounding the policy, this very diverse group, known as the Transportation Policy Advisory Committee (T-PAC), came to unanimous agreement after only 6 months on the rules to guide the process. Among the many issues debated by the group were the definition of "significant highway projects," the type of state transportation plan to be developed, and the nature of the public involvement process.

The rules propose new RTACs in eight areas not included in existing MPO boundaries (17). Similar to MPOs, the RTAC's role is to advise the department on issues and goals, regional transportation needs, improvement priorities, and multimodal system options. According to the rules, the regional advisory groups are the cornerstone of MDOT's new public participation process and are expected to help ensure "early and effective public" input. Each RTAC includes up to 24 representatives of local and state government and citizens, who are selected by MDOT to represent the interests of planners, environmentalists, business and commerce, various transportation modes, historic preservationists, the elderly, and the disabled. Initial membership of about 170 was chosen by MDOT from more than 450 applications. Two concerns with the RTAC selection process expressed by local planning staff involved the lack of consultation with local elected officials on membership. First, the application method encourages a certain degree of "self-selection," so that representation of the general citizenry is not assured. Second, local officials expressed concern about the appearance of MDOT controlling a process that was intended to be locally based.

The RTACs' first task was to develop a regional transportation plan. Under the policy's rules, the regional plans provide the basic input into the state plan. With the success of the T-PAC process as a model, the RTACs were given the goal of reaching consensus on their respective regional plans. MDOT provided staff contacts from its headquarters and initial facilitation and information sessions on transportation

and land use planning issues. The diversity of membership helps ensure that the group considers many viewpoints, but it does not guarantee consensus. It should be of great interest to practitioners that in all cases, majority agreement, if not true consensus, was reached on the RTAC plans. In some cases, this appears to have been accomplished by keeping the plan fairly general. However, several individuals interviewed for this study believe that the cooperative spirit engendered by the T-PAC process carried over to the regional planning process. Others found that the educational process and the process of open discussion on the various members' perspectives provided a bridge between previously opposing views.

### *Process Promotes Multimodal Plan and Implementation*

As a group, the regional plans reflect the multimodal emphasis of the policy. The involvement by design of modal interests ensured debate on the individual modes, but the degree to which there was cross-modal evaluation or detailed technical assessments is not clear. Dan Fleishman, interim director of the Southern Maine Regional Planning Commission that staffs the areas' RTAC, stated that the regional agencies are not doing technical planning but addressing policy issues. Some of the plans are quite general in nature, with others being more specific including projects. Among the plans' proposals are intermodal passenger and freight terminals.

Under the rules, the regional plans provide the basic input to the state plan, which was adopted in January 1995. As envisioned by the policy, the state plan addresses a wide range of modes as well as transportation efficiency measures. According to Bruce Hammond of the Natural Resources Council of Maine, a major proponent of the policy, "The plan is a major departure from past state proposals in that it is very multimodal and incorporates such concepts as transit-oriented development. The challenge comes in showing that the plan has been incorporated into decisionmaking."

An early indication of the department's interest in plan implementation and of continuing public involvement is the T-2000 process, being implemented in FY'96. The MDOT has designed the process to respond to the state plan's direction on cost-effective alternative modes outside of metropolitan areas. According to the Request for Proposals, "MDOT intends to use this program and the RTAC citizen participation process to more fully develop and implement alternative mode, TDM, and land use strategies that will be cost effective and politically acceptable to the people of Maine."

T-2000 is administered as a competition within each region and applications by local governments are emphasized, although citizens with municipal sponsorship also are eligible. A 20 percent local match is required. The RTACs will review all applications and rank them according to their own

ranking system consistent with state guidelines. From this input, MDOT will select up to three projects for each region for further development and funding in phase two. (There is a \$625,000 cap for each region's projects.) In the research team's view, this unusual and highly innovative program demonstrates the MDOT commitment to continuing local input through implementation. The actual results of this tool for multimodal planning cannot be assessed at this time, but subsequent examination may prove instructive to the issue of direct public involvement in policy and plan implementation.

### **Case Study C: Experimenting with Techniques in Boise**

#### *Background*

The Ada Planning Association (APA), the MPO for the Boise region, is responsible for planning for Ada County and its municipalities. The planning area incorporates a rapidly growing urban area surrounded by distinctly rural areas. In this relatively small region of less than 200,000, the APA has demonstrated a continuing commitment to public involvement since the adoption of a public participation process in 1985. Since that time the agency has used a variety of techniques to obtain public input. During the last five years, the APA has conducted two long-range planning processes and a major subarea study (18).

#### *Going Beyond the Usual Suspects*

In 1988, the APA began the process of updating its long-range transportation plan. This process used a series of four public meetings to first educate participants and then to review proposed projects and alternatives. The final meeting was a traditional public hearing to consider the recommended alternative. This series of meetings was repeated in several locations, with the process used in rural areas differing primarily in that participants were designated by local officials. A long-range plan draft was presented for board approval in 1990. After 2 years of discussion and revision, it was approved in 1992. The board's primary concern was the lack of input from the general citizenry. According to Irv Olen, APA Deputy Director, the staff and board both observed that the same people attended most APA public forums and the board wanted to hear from "the rank and file within the community."

In January 1995, the APA began the process of developing a new long-range plan for the region, which utilized a carefully crafted public participation program that differed substantially from past efforts. The new process was really three parallel processes, or tracts, divided into three defined stages: Vision Development, Plan Development, and Plan Adoption. The staff intentionally used information from each

of these tracts as input into key products in the second and third stages of the process. In some cases, information from one tract was provided to another tract.

The first of the three tracts, Random Input, used a structured scientific process to determine community attitudes and interests. This approach included a series of surveys and focus groups. The two focus groups were used to test the validity of the information coming from the surveys. As in St. Louis, a primary goal of this tract was to determine the views of the “uninvolved.” To ensure this outcome, focus groups did not include anyone who had ever been involved in the planning process.

The second tract, Input/Educational, is described by staff as the “traditional” approach. In this case, a variety of information materials were prepared and distributed through several channels, including newsletters sent to individuals on the organization’s mailing list. The traditional approach included a series of public meetings and presentations to community groups at the two key stages of vision and plan development.

The third tract, Policy Oversight, utilized a community team of 100 members, which essentially served as a steering committee for the whole process. In this capacity, the community team had the benefit of information obtained from the other two tracts, thus making the plan the product of all the techniques used in the three tracts. The team consisted of a majority of APA board members, leaders from civic, business, and neighborhood leaders as well as eight individuals who had never been involved in any civic or public process. The latter group was comprised of individuals who were initially identified from community surveys conducted as part of the Random Input process.

The first task of the community team was to develop the vision. The vision served as the screen for projects that ultimately were incorporated into the plan development stage. The vision was also tested through public meetings in the traditional tract and a second public opinion poll. The poll used statements representing the policies and goals included in the document. The community team reviewed the product of the plan development stage before a traditional public hearing was scheduled.

Clair Bowman, APA director, sums up the whole process as an effort to give the elected officials who serve on the board “a cross sectional view of the community and balance the views of the self-selected” who normally participate. Bowman sees each technique as contributing to either the content of the plan or to its credibility.

The new plan, Destination 2015, was unanimously approved by the APA board 14 months after it began.

### *Public Opinion Spurs Multimodalism*

The first public opinion survey provided a base of information to start the community team’s discussion. A clear

theme of the survey was the public’s willingness to consider nonhighway modes. Irv Olen points out that “the public is beginning to see the benefit of not depending on one mode.” While the plan continues to recognize the region’s emphasis on roads, the public interest in alternatives resulted in a planning process and plan that gives far more attention to multimodal strategies.

## LESSONS LEARNED

Through the three highly innovative examples described in this chapter and in examples cited in Chapters 6 and 7, the issue of public involvement as a tool of multimodal planning is explored and documented. The cases included here demonstrate that effective participation programs have encouraged multimodal consideration in plans and programs as well as in the implementation of plans and programs. The voter referendum in Maine, while unique, is a clear example of a phenomenon observed across the country: policy issues are being raised and defined by forces outside the traditional planning community. In St. Louis, the successful effort to bring new players to the planning process has produced a very different type of plan that incorporated detailed multimodal strategies for addressing newly defined transportation needs.

As compelling as these examples are, not all public participation efforts will foster multimodal planning processes, as defined in Chapter 1. There is some evidence that the result may be to promote advocacy for adding projects of a particular mode, rather than cross-modal evaluation as part of the search for the best means of meeting the needs of the person or thing to be transported. However, public participation can be an effective tool in better understanding the needs of users or potential users of transportation, and in that context, it is a very important contribution to the multimodal planning process.

To help structure an effective participation process, the cases described in this chapter illustrate certain important lessons for the practitioner.

**Early efforts to involve the public in the planning process are important to the credibility and acceptance of the plan.** Letting the public in on the ground floor when transportation issues and needs are determined before projects are defined builds support for the program and can improve the chances of implementing plans and projects. The importance of this theme can be seen in the cases cited in this chapter, where in all cases the issue of public involvement was a threshold consideration in devising a structure for the planning process. In the research team’s view, MDOT’s response to implementing a controversial transportation policy that it had originally opposed is a prime example of the advantage of early consultation for a new process. The MDOT leadership chose to reach out and bring in all known outside interests to design a program to implement the new



policy. The result was credibility for the process despite the recent controversy and, eventually, consensus around the state's new transportation plan. This theme is reemphasized in the examples described in Chapter 6. Increased support for state DOT programs is evident in two states where statewide planning processes involving rural areas were also highly participatory from the start.

**Continuing public involvement in implementation of the plan's proposals increases the likelihood of plans moving from paper to structure and services.** This "new way of doing business with the public" can be seen in the early results of plan implementation in both Maine and St. Louis. The effective partnerships developed in both these locales during the plan development stage are continued through to the implementing strategies. In both cases, the sponsoring agencies are continuing to use the public input process to refine needs to be met and strategies for accomplishing this mobility.

**Using several different methods and venues for engaging the public increases the chance of involving the typically "uninvolved."** The research identified a high degree of experimentation in the methods and approaches being used to garner public input. The APA in Boise serves as a laboratory for a range of approaches and for careful evaluation of the effectiveness of each. The results of the APA's latest

planning process should be the subject of follow-on research to document the results of this comparative approach. The research team, however, did not find any single technique that attracts the broad range of participants called for in the federal guidelines. In the most successful examples, the team observed the use of a structured program employing a variety of techniques designed to involve particular groups and used at certain stages of the process. Focus groups have been used successfully to elicit a better understanding of the needs of particular groups; planning charrettes help the public visualize solutions to particular problems; a newsletter can be a cost-effective way to keep a large number of people informed of the process; and scenario development has been used effectively in visioning processes. Although the team saw the successful application of new technologies, some standard techniques are being put to new uses. For example, the use of community surveys in Boise to identify the "uninvolved" illustrates a new use of an old tool, which has more typically been used to determine general citizen interests.

In addition to these themes, the remarkable example of participatory planning in St. Louis illustrates the advantage multidisciplinary agencies offer in the process of linking transportation to other community issues and involving users and potential users in system planning.

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## CHAPTER 6

# APPROACHES TO MULTIMODAL PLANNING AFFECTING RURAL AREAS

### INTRODUCTION

ISTEA requires state DOTs to give policy attention to the needs of rural America and to make regular transportation investments in these areas. Under the Surface Transportation Program (STP) established by ISTEA, states must obligate funding for nonurban areas (under 5,000 population) at a level of at least 110 percent of the amount of funds apportioned to the Federal Aid Secondary System in FY'91. To guide this and other investments in rural areas, the states also are directed in Section 135(c)(5) of ISTEA to consider "transportation needs of nonmetropolitan areas through a process that includes consultation with local elected officials with jurisdiction over transportation."

A major challenge to implementing these new consultation requirements in rural areas is involving local officials, who are required to serve in many capacities in these sparsely populated regions and may be reluctant to take on new responsibilities. This chapter looks at the experience of three state DOTs, which attempted a structured planning and consultation process statewide, including in rural areas. Observations are made about the relative benefits of the different approaches employed by Colorado, Vermont, and Minnesota to the development of the state transportation plans and programs. The extent to which the process and/or outcomes are multimodal in nature is also reviewed.

### OBSERVATIONS

Through the broad review of state and MPO planning practices described in Chapter 1, four criteria were identified for determining the case studies for this chapter. These include the

- Extent to which public officials of rural communities and counties were involved in the planning and/or programming decisions;
- Degree to which plans and/or programs incorporated multimodal considerations;
- Use of new planning techniques applicable to rural areas; and
- Applicability to other states of the process or organizational structure used in the example.

Applying these criteria, 11 states had made noteworthy efforts to involve rural interests in planning or programming. Among this group, Colorado, Vermont, and Minnesota offered distinctly different approaches to meeting the rural requirements, but each example could have applicability in other states.

The choice of these three examples was strongly influenced by the early research, which revealed a high degree of interest among state and local officials in both the type of organizational approach used to implement statewide planning and in successful methods of involving local officials in rural areas. In each of the three cases selected, the state elected to meet the rural planning requirements by assigning substate institutions increased responsibility for planning and/or programming. Although each of the cases deals with statewide approaches to planning and programming, rural interests were incorporated in each, and special efforts to address uniquely rural issues were made in the process. In choosing to examine statewide processes that included rural planning activities, the project team also was able to consider best practices in addressing a fundamental concern of state and local officials: how to ensure equity and balance between rural and urban interests in developing statewide improvement programs.

### THEMES

From this review of recent practices, four elements are important both to the perceived credibility of the effort and to the guarantee that the process is multimodal in its consideration of potential problems and possible solutions.

**Involvement of elected officials in determining who speaks for the region builds credibility from the beginning.** Officials in several states believe that the commitment to involve local elected officials from the beginning is an important factor in building credibility in the planning process. In both Colorado and Vermont, officials credited support by local officials for recent success with their legislatures. However, involving local officials—elected and appointed—in new planning activities is especially challenging in rural areas where officials often serve in multiple roles.

**State policy guidance is welcomed by local officials.** Participants in the regional planning processes seem to wel-

come the focus given to the planning process by an initial policy framework. Especially in rural areas where experience with transportation planning is limited or nonexistent, policy guidance provides a starting point for regional discussions.

**Policy guidance and information are critical factors affecting multimodal considerations.** Again, it appears that policy direction from the state transportation agencies to consider other modes increased this activity among regional planning agencies. Additionally, many participants expressed frustration with the lack of data concerning non-highway modes and the constraint this places on considering multimodal issues.

**Techniques are needed to resolve concerns about equity between rural and urban interests in statewide planning processes.** Not surprisingly, bringing rural interests together with urban ones at either the regional or the state level produces concern about potential inequities in allocation of resources between rural and urban areas. The cases examined in this chapter provide useful examples of how to avoid or moderate those concerns.

## CASE STUDIES

### Case Study A: New Transportation Planning Regions in Colorado

#### *Background*

In 1991, several months before passage of ISTEA, the Colorado General Assembly enacted a law creating the Colorado DOT (CDOT). The state law shares many of ISTEA's policy objectives, including that the state prepare its first long-range transportation plan and that consideration be given to multimodal issues, public involvement, environmental concerns, and coordination with local land use planning. CDOT took these new planning challenges seriously, and through the newly established Transportation Development Division, began a lengthy process of local consultation that culminated in January 1996 with the state's Transportation Commission unanimously adopting Colorado's first long-range transportation plan. Along the way, special efforts were made to ensure that rural concerns were equitably represented in development of the state plan and improvement program.

#### *Local Input: A Cornerstone of the Process*

As part of the restructuring of the former Department of Highways, the legislation required CDOT to develop the state plan based on input of local officials in defined transportation planning regions. Except for preserving the authority MPOs in the five established MPO planning areas, the law did not identify the geographic boundaries of the regions, nor did it provide funding for the regional planning process. Responding to the mandate for local involvement, CDOT

staff surveyed all counties and municipalities to determine the local view of what should be the regional planning area. Subsequently, almost 100 percent of local governments signed memorandums of understanding (MOUs) to participate as members of regional planning commissions in 15 regions, 10 of which are largely rural in nature (19). As a result of the consultation process, two MPOs incorporated rural areas in their planning boundaries, and the remaining three did not.

The new RPCs are comprised primarily of local and county elected officials, although some professional staff represent their local governments. CDOT has given the RPCs key roles in developing the state long-range plan and the annual programming of projects. This regional input into decisionmaking represents a substantial departure from past practice in the state, where local input occurred largely through annual meetings between CDOT and county officials. The eventual willingness of counties to give up power to regional decisionmaking is surprising to observers both inside and outside the department. A CDOT staff member who plays a key role in the RPC process, Bill Stringfellow, credits the early and continuing involvement of local officials as establishing credibility for the process. "Several county officials became advocates for the process with their colleagues," he recalls.

Among the many challenges of instituting a new planning process, CDOT faced the inevitable gap between regional plan ambitions and the ability of the state to finance the proposed projects. Again, CDOT turned to local officials to solve the problem. A Statewide Transportation Advisory Committee (STAC) was established to help coordinate the new process with CDOT. The STAC is comprised of one representative from each of the 15 RPCs. While the STAC has other oversight responsibilities, a primary role is to "review the regional plans and help assure equity in the allocation of funds (16)." The unanimous approval of the state transportation plan earlier this year is a testament to the success of this approach.

When the regional plans were completed in 1994, the CDOT staff turned to making the regional plans into the state plan. During this process, CDOT continued to rely on the STAC to advise the department on the integration of the RTPs into the state plan and on certain statewide issues that had not been included in the regional plans, such as modal linkages. Finally, CDOT involved the STAC in the process of reducing the level of project commitments in the first draft of the plan to bring the total funding required closer to anticipated dollars, thus carrying the commitment to local input through the long-range planning process.

#### *Finding the Technical Support for Rural Planning*

To get the process started, CDOT allocated between \$30,000 to \$50,000 to each of the RPCs and assigned 20 staff members from headquarters to support them. As in many

other states, Colorado faced the challenge of giving adequate planning tools and resources to communities outside MPO boundaries that had little experience in transportation planning. To address the imbalance in experience between the urban and rural RPCs, the agency developed a guidebook for the rural areas that outlined broad policy goals and defined the time period and elements of the plan and the process and schedule for developing it. The guidebook also was intended to include certain multimodal planning tools appropriate for rural planning, but CDOT staff found that affordable tools were not readily available.

The staff also had a goal of providing available planning data to the RPCs. They were able to gather state data on current and projected demographics and employment but found that data on rural transportation systems other than state highways were lacking. Through special efforts, including a survey by the Colorado Transit Association, some gaps were filled, but rural data, especially nonhighway data, remains a problem to be solved when the plans are updated.

### *Conclusion*

Colorado embarked on a mission to develop its first ever state plan with ambitious goals to involve local officials throughout the process. Despite its lack of experience in conducting statewide planning, CDOT devised a process that has garnered the support of district and headquarters staff, local officials, and modal advocates. The credibility of the process allayed rural officials' concerns about equitable treatment and resulted in unanimous approval of the plan by the state's Transportation Commission. In the view of participants in this study, the regional planning process provided a new and useful forum for multimodal discussion. According to Jean Erikson, Director of the Colorado Transit Association, the regional planning process "is a good way for transit to become noticed; it's the beginning of a mind shift here."

### **Case Study B: Vermont Finds New Role for Regional Planning Agencies**

#### *Background*

Vermont's Agency on Transportation (AOT) launched the Transportation Planning Initiative (TPI) in early 1992 as a means of involving local officials in implementing the new planning and programming requirements of ISTEA. The agency chose to use 12 RPCs, which had previously been established to implement the state's land use law. The RPCs offered the advantages of existing staff and administrative resources and prior experience in considering transportation issues. One of the RPCs houses the state's only MPO. While the RPCs were already required to address transportation in their comprehensive plans, new resources provided through the AOT initiative resulted in far more detailed plans and

consideration of more modes than previously done according to interviews with RPC representatives.

#### *Local Partnership in the Planning Process*

Planning Director Jeff Squires found ISTEA's new planning objectives were consistent with the state goal to move decisionmaking as close to the local level as possible. He describes the Planning Initiative as a long-term commitment to local officials to effect the AOT planning and programming processes. He supports the use of the RPCs, in part, because their planning requirements directed consideration of many of the ISTEA planning factors. Initially, the League of Cities and Towns was concerned about the proposal to use the RPCs and wanted the DOT to have separate relationships with the 246 towns and villages. When polled directly, however, a majority of the town select boards agreed to use the 12 RPCs as the conduit for local opinion.

AOT's Bruce Bender believes that early consultation with the select boards reassured local elected officials that their views were important to the state agency. While the state designated the RPCs as the responsible local agency, the selection of town representatives and their relation to the RPC policy boards were left to individual select boards. The result is a mix of town road commissioners, local selectmen, and some citizens and transit operators (where they provide service) generally serving on Transportation Advisory Committees (TACs) to the policy boards. Other representatives of modal interests also are included depending on their local activity. The state urges RPCs to have regular communication with select boards to keep the tie to local officials as close as possible. The town boards reviewed the original scope of work for the respective RPC and must concur in any plan that emerges from the process.

The AOT uses the increased planning funds from ISTEA to provide an average of more than \$150,000 to each RPC per year as well as assigning AOT staff coordinators to work with the RPCs. The RPCs provide only a 10 percent match. The new transportation funding represents a substantial addition to the funding provided by the legislature for the RPCs original mandate for environmental and land use planning and reviews.

The AOT provided detailed guidance on policy, process, and administrative procedure, but the staff was careful to allow local priorities to guide the plan development and project selection processes. A prior effort by the state to use the RPCs for solid waste planning had proven difficult to implement when the state agency involved tried to apply a uniform process to all the RPCs. The AOT also has given the RPCs a great deal of flexibility in determining how to develop their plan and to establish ongoing technical support. Several RPCs chose to hire new staff, while others put more emphasis on consultant efforts. The AOT staff also meets regularly with the RPCs to work on both technical and pol-

icy matters. Interestingly, while the RPCs like the flexibility inherent in the process, several were glad to have the policy framework established by AOT.

Two important results of the first 3 years of the TPI are cited by representatives of all four RPCs interviewed. First, the local governments gained a much greater understanding of the complexity of the requirements facing AOT in the project development process. Dissatisfaction with delays in AOT project development has been a frequent complaint of local governments and of some legislators for a number of years. According to Sandy Young, the director of the Middlebury RPC, “no one was happy with the AOT process . . . now towns are getting a better understanding about how cumbersome the process is, and how it should change.”

Second, a clear sense of the TPI being a joint effort between local government and the state emerged from the interviews, with AOT coming out a winner. Although none of the RPC participants thought the process was perfect, there was strong support for the effort. Don Bourdon, Director of Two Rivers Quetaquechee Regional Planning Commission, expressed the view that reorganization at AOT to decentralize planning is ongoing and will take time, but on balance the TPI represents a big improvement over past relationships with local governments. “Regional coordinators have been very available and have been our advocates,” he reports.

Additionally, some of the participants expressed the view that greater analytical capability in the transportation area was helpful to their deliberations on land use issues. For example, one RPC director said the experience with the plan development has led the agency to examine access management as part of this year’s work program. Others indicated that the greater awareness of the practical constraints on implementing transportation projects would make them more cautious in approving projects dependent on transportation improvements. However, it appears to be too early in the process to draw firm conclusions about the actual effect of the TPI on land use considerations.

### *Multimodalism in Rural Planning*

In developing guidance for the plan, the AOT established multimodal considerations as one of the objectives in the development of a comprehensive regional transportation plan. The resulting plans vary substantially from earlier comprehensive plans prepared by the RPCs in the extent of multimodal and nonhighway projects proposed. Participants agree that there was far greater interest in nonhighway services in the new plans and that the focus is on the needs to be met rather than on facilities. Laurie Emery, of the RPC based in Montpelier, believes that the TPI objectives were critical to making their TAC much more receptive to broadening transits’ role in the area. “The Commission wanted to stop

dealing with just widening roads as a response to problems,” she explained in an interview.

Bender sees the plans generally as being a good start but less comprehensive (multimodal) than they had anticipated. Generally, regional plans that include a town of substantial size (still not a metropolitan area), such as Montpelier or Rutland, incorporate rail and transit improvements. The plans for the more rural areas, with low tax bases and a substantial percentage of unimproved roads, reflect those needs. Recognizing the growing importance of skiing, hiking, and bike touring to Vermont’s tourism economy, trails and improvements for pedestrian and bicycling safety are discussed at length in many of the plans and also are reflected in subsequent TIP discussions and project rankings.

Bender also points out that there is a high degree of interest among RPCs in freight and goods movement issues in even the most rural areas, but there is little useful data on these activities. As in Colorado, addressing the issue of reliable nonhighway data poses a continuing challenge to the multimodal planning process.

Although the outcomes of many of the 11 non-MPO plans are primarily related to roads, the need to respond to the TPI objective of multimodalism appears to have caused the RPCs to wrestle with multimodal issues in their development of the long-range plan. This discussion of public transit from the Windham Regional Plan is instructive:

The provision of public transportation services in rural areas is difficult and it can be extremely expensive, at least on a per unit-of-service basis. While some residents and organizations have expressed a desire for increased service on a formal basis, the encouragement and support of less expensive, informal means has also been proposed. Some of the concerns in regard to public transportation in rural areas are:

- Safe and convenient locations are not adequate for effective carpooling or other ride sharing attempts.
- The Region’s residents do not have enough information to easily access transportation assistance that may be currently available.

Some suggestions include:

- The number and convenience of park and ride lots needs to be increased in order to serve commuter from rural areas more effectively.
- Public transportation providers, including human service agencies, need assistance in order to more reliably provide transportation services to rural populations for employment, health care, etc. (20).

### *Conclusions*

At this stage, Squires believes that the improved local relationships and related support helped in the annual legislative funding process this fiscal year. In the interview, he stressed the importance of involvement by local elected officials as one means of increasing the standing of the agency’s recom-

mendations with the legislature. He and several of the RPC participants in the study also expect that the TPI process will result in fewer delays in project development because projects will be much better understood and related to regional goals. “Previously, AOT got into trouble when it came time for project hearings,” Young points out. She expects generally less acrimony in the future.

### **Case Study C: Local Partnerships in Minnesota**

#### *Background*

Like Vermont, the Minnesota DOT (MnDOT) was looking for ways to decentralize decisionmaking at the same time that it was determining how to respond to the new federal requirements. As described in Chapter 2, the DOT established ATPs in 1992 as a response to these two new policy directions. The ATPs were designed by MnDOT to bring local and regional organizations into the decisionmaking process around the programming of projects. As in the other cases cited in this chapter, the ATPs were set up statewide, representing both rural and urban communities.

#### *Local Partnership in the Planning Process*

Unlike Vermont, MnDOT did not use existing regional organizations, nor did it establish new ones along locally determined boundaries as in Colorado. Instead, due to the department’s interest in decentralizing, MnDOT structured the new ATPs along MnDOT district boundaries and gave district engineers the primary responsibility for staffing the effort. Also, unlike the two other examples discussed in this chapter, the ATPs are not formally chartered organizations but rather serve as committees involving existing organizations. Membership varies but generally involves state, local, and county transportation officials; four of the eight ATPs have several local elected officials on their rosters.

The role of ATPs is limited to development of the area TIP (ATIP), which is an input to the STIP. In this regard also, the Minnesota model differs substantially from the other two cases where the regional agencies develop the regional plan and are involved in the annual TIP. During a joint workshop of ATP and MnDOT staff in 1993, the role of ATPs was discussed, with a general agreement that a greater link to the regional and state planning process was needed. Some ATP members commented on the state plan and others participated in the planning process of the RDCs, but the link between the ATP process and regional and state plans is not always clear.

The institutional setting for regional transportation planning is far more complex in Minnesota than in the other two states. In addition to MPOs in the seven urbanized areas of the state, Minnesota has nine active regional development commissions (RDCs), which were created in 1969 to do eco-

nomic development, housing, and environmental planning. RDCs also receive funds from MnDOT to conduct transportation planning and develop regional plans. The ATPs serve as a forum for considering transportation projects in their area. RDCs, transit operators, and local and county officials participate with MnDOT district staff in the process. In urban areas, MPOs also have a vote. Because district (now ATP) boundaries do not always coincide with RDC or MPO boundaries, some ATPs have several RDCs and/or MPOs at the table, and some of these organizations must participate in more than one ATP. Several ATPs also include both distinctly urban and distinctly rural areas.

The definition of the planning area surfaced as a concern among some ATP members early in the process and has been the subject of discussion at workshops involving the ATPs. Concerns have centered around two things: (1) the mix of urban and rural interests in some ATPs, which has led to questions of urban dominance in these regions, and (2) the inconsistency of district boundaries with other regional agencies. MnDOT has given the ATPs flexibility in their membership and is looking at various alternatives to reduce overlaps and gaps among the organizations represented on the ATPs.

In establishing the ATPs, participants spoke of concerns both inside and outside the department that they “would be just another layer of government,” and that various MPOs would either lose power to the ATP process or dominate the process. After 3 years of experience, non-MPO participants seem satisfied that, generally, there is equity among the parties and greater local input. Some MPOs believe the TIP process is less meaningful to them as they still have to compete at the ATP table after they have developed the MPO TIP. However, according to Kathryn Briscoe, MnDOT MPO coordinator, MPOs have fared as well, or better, financially under the ATP process. Randy Halverson, Assistant Director of Transportation Research and Investment Management, describes the creation of ATPs as “an evolutionary step that improves coordination/communication between the DOT and local jurisdictions.”

#### *Multimodalism in Rural Planning*

Minnesota has had centralized modal offices in headquarters since the creation of the DOT in 1976. In Chapter 2, the MnDOT effort to develop more multimodal evaluation capability at the district level was discussed. Because of problems in establishing staff capabilities in these areas at the district office level, it may be difficult for the ATP process, which is staffed by district offices, to reflect multimodal considerations to any substantial degree. In the view of several participants, however, the ATP process has increased the range of project types considered in many regions, including rural ones. Chapter 7 reports that many rural transit operations have benefited from the purchase of vehicles using federal STP funds—decisions fostered by the ATP process.

## Conclusions

Minnesota has adopted a regional process for assisting the state in the development of the transportation improvement program. Although this process is more limited in scope than those implemented in the two other cases considered in this chapter, it has served as an effective means to both opening up the decisionmaking to local concerns and to more directly involving district offices in programming. There are important lessons to be learned around determining planning boundaries by comparing Minnesota's experience with the other two cases presented, and these lessons are applicable to other states considering regional planning as a tool of involving rural interests.

## LESSONS LEARNED

The three states reviewed in this chapter have used innovative methods to improve local input into the state's transportation planning process on a continuing basis. Although each state appears to have been influenced by ISTEA in designing their process, there were other agents for change within the DOT or the state legislative body that promoted a new approach to the state planning process generally and to local input specifically. In each case, rural areas benefited from the general interest in more regular local involvement through the development of regional organizations that gave them a voice in state planning and/or programming decisions. Because the reasons for undertaking the effort differed in each state, the approach and results also may differ, but it is clear that, at a minimum, relationships between local and state transportation officials have been advanced. It is also evident that multimodal planning can be fostered by the state with measures as simple as plan guidance that encourages multimodal consideration.

With regard to rural issues in planning *per se*, it appears that, like their more urban counterparts, regional planning organizations in rural areas want clear policy guidance, multimodal information, and access to technical expertise. From the cases described in this chapter, it appears that the availability of nonhighway data is an especially vexing problem for rural planning and may impede consideration of multimodal solutions simply because of lack of information with which to compare alternatives. Another issue reported in many states is the problem that rural officials seem to be even more affected by the need to serve in many more capacities than urban officials, because there are usually fewer local officials—elected and appointed—to serve on boards and commissions. This point is important when considering consultation processes in rural areas: multiple planning organizations pose a special burden due to the demands on local officials' time.

The following are major themes that are identified from the case studies in this chapter.

**Involvement of elected officials in determining who speaks for the region builds credibility from the beginning.** In both Colorado and Vermont, the involvement of local elected officials is seen as a critical factor in the credibility of the local planning initiatives. The state legislation directing the formation of transportation planning regions in Colorado specified the predominance of local elected officials. To start the effort, CDOT undertook a lengthy process of consulting with local officials on the boundaries of 15 new transportation planning regions and got written agreements for each area before proceeding.

The existence of viable regional planning bodies that had both staff and some experience in transportation planning helped jump-start the Vermont process. While the presence of elected officials varies with each RPC, the AOT encourages local elected officials to serve on the TACs that have been set up in each of the regional planning bodies. About half of the TAC members are elected officials. Still, the agency is careful to ensure regular information flow from the state and from the RPCs to their respective local elected officials. Officials in both states believe that the commitment to involving local elected officials is an important factor in recent success with their legislatures. According to Jeff Squires, Deputy Director of Vermont's AOT, "The process is far more credible in everyone's eyes, especially the legislature, if elected officials are making the recommendations."

In Minnesota, the DOT views the formation of regional coordinating committees more from an organizational perspective, as an important step in decentralizing the agency's programming function. For this reason, the MnDOT chose to form coordinating committees in each DOT district to guide the programming process rather than elevate the planning activities of existing regional development commissions (and MPOs in metropolitan areas) in state programming decisions. Participants in the process are primarily transportation or planning staff at the state, county, and local levels, with a minority of elected officials participating in four of the eight ATPs. The process has met the organizational objectives of MnDOT and has resulted in a broader array of project types being considered in the programming process.

However, a cautionary note is in order. From interviews in these and other states, the research team learned that getting local officials to participate is especially challenging in rural areas, where both elected and appointed representatives are required to wear many hats.

**State policy guidance is welcomed by local officials.** Despite the interest in giving local officials maximum opportunity for establishing local/regional priorities and plans, participants in Vermont and Colorado expressed a need for policy guidance to help focus local efforts. This preference was stressed most by regional interests in the more rural areas of the two states, where transportation planning experience is limited. Here, participants especially felt the need for both a starting point and a scope of inquiry. In the two cases, state officials gave only broad policy guidance and were reluctant

to be too prescriptive. Although in response to requests from the regional agencies, each DOT provided extensive technical assistance, including discussion of policy issues.

According to several participants in these and other states, incorporating regional plans into the state long-range plan was more difficult when the plans lacked common elements and policy assumptions. Maurice Rahini of the Pikes Peak Council of Governments in Colorado, whose agency also served as staff to one of the rural RPCs, summed up the view of a number of local officials in that, while they appreciated the freedom to develop unique local plans, they would like to start from a similar policy base. Local and regional officials also recognize the practical difficulties faced by state DOT staff in trying to effectively base state plans on widely divergent regional plans, and they believe their views may be better represented in the final document if there is more consistency in the type of issues addressed.

**Policy guidance and information are critical factors affecting multimodal considerations.** Although policy guidance was limited in the cases considered in this chapter, participants in the development of regional and statewide plans stressed that the multimodal objectives in the state guidance ensured that consideration would be given to nonhighway modes. Representatives of three rural Vermont RPCs were unanimous in their view that their new plans gave greater consideration to other modes than in the past, at least in part because of the state guidance to address other modes. This view also was expressed in interviews on state planning conducted in several other states.

In these same interviews, the research team learned of the limitations to multimodal considerations given a lack of information on nonhighway modes. Although participants in all three states had started with the hope of using multimodal analysis techniques, especially when making investment decisions, they quickly realized that even if such techniques were available, they lacked the basic information required.

**Techniques are needed to resolve concerns about equity between rural and urban interests in statewide planning processes.** Rural officials in many states share a common concern that urban organizations will have more influence when it comes to forming state plans and programs from the various regional priorities. The creation of the STAC in Colorado, where every regional planning commission names one representative, serves as a positive example of how to resolve this issue and enhance credibility for the entire process at the same time. The STAC was required by the legislature to ensure equitable consideration in the statewide processes, and the strong support for the Colorado Long-Range Transportation Plan by both rural and urban interests suggests that the technique succeeded.

Minimizing this concern within the regions starts with careful consideration of boundaries. Local officials in both Minnesota and Vermont expressed concern over rural interests being overwhelmed when urban and rural planning areas are merged into one area. However, examples where the combination of these interests produced greater understanding of each party's transportation concerns were also observed.

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## CHAPTER 7

# APPROACHES TO FINANCIAL CONSTRAINT IN PLANNING AND PROGRAMMING

### INTRODUCTION

The financial constraint requirements of ISTEA require MPOs and DOTs to demonstrate that there are reasonable sources of funding for the projects included in their TIPs. In addition, ISTEA requires MPOs, but not state DOTs, to also demonstrate that reasonable sources of funding are available to finance the projects and activities included in their long-range plans. (Sections 134[g][2][B] and 134[h][2][B] of Title 23 require MPO long-range plans and TIPs to include financial plans that “demonstrate how the transportation improvement program can be implemented, indicate resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommend any innovative financing techniques to finance needed projects and programs, including such techniques as value capture, tolls, and congestion pricing.”)

The financial constraint provisions, which were intended, in part, to establish greater accountability and credibility in the development of transportation plans and programs, have presented new challenges to the planning and programming efforts of both MPOs and DOTs. To comply with the financial constraint requirements, these agencies were required to develop plans and programs that were more realistically based on identified and anticipated levels of existing and future transportation revenue. This approach resulted in many cases where the size and scope of plans and programs had to be scaled back to more accurately reflect anticipated levels of funding.

While imposing financial constraint has clearly led to reductions in the size and scope of transportation plans and proposed programs, the impact, if any, that the provisions have had on transportation priorities and multimodal planning is unclear. The central objective of this research is to illustrate whether or not these provisions have changed planning and programming processes and their outcomes and, specifically, how they have affected multimodal planning.

### OBSERVATIONS

The following observations emerged from a number of sources. Although interviews and a review of recent literature were the primary sources of information, the research team

also referenced prior experience with state DOT and MPO programming processes. Minnesota, Wisconsin, and the Pittsburgh region were chosen for this chapter because they have approached financial constraint in ways that are representative of approaches by several other states and MPOs.

In each of these cases, planners were struggling to address sizable transportation needs without adequate levels of funding. The financial constraint requirement exposed these funding gaps and forced a more critical evaluation of need. From the cases examined, the research team found that financial constraint has imposed more discipline on the planning and programming process.

### THEMES

The following themes summarize the effects of financial constraint on multimodal planning and programming processes.

**Financial constraint requires decisionmakers to consider investment decisions more carefully.** The states and MPOs examined as part of this research had been as much as 40 percent over-programmed before they had to address the financial constraint requirements. Taking projects off what had traditionally been a “wish list” proved to be an extremely difficult task. Participants indicated that more debate and careful consideration occurred during the planning process as planners had to develop methods of prioritizing projects, politicians had to find other ways to represent the interests of constituents, and the public had to consider its willingness to pay for projects that remained on the list.

**Financial constraint discourages the “wish list.”** Prior to ISTEA, over-programming was a problem because (1) time was wasted as infeasible projects were considered, analyzed, planned, and debated, and (2) efforts to make hard choices among a limited number of possible projects were discouraged. The three cases examined show that the financial constraint requirements caused many unfunded projects to be removed from plans and TIPs and also eliminated them from future consideration. In other cases, they have been retained in unconstrained versions of plans and/or shifted to major investment studies.

**Financial constraint increases the demand for funds that are not restricted to any one mode.** Although multi-

modal considerations and planning activities increased in many of the cases that were examined for this report, the categorical nature of state funding programs became an important issue. Restrictions on how funds may be allocated among the several modes may discourage continued multimodal planning efforts because of uncertainties about the ability to ultimately fund certain types of projects. Thus, having flexible financing programs at both the federal and state levels encourages multimodal planning and leaves open the possibility of funding outcomes of the planning process.

**Financial constraint limitations are imposed late in the planning process.** In response to the belief that financial constraint may discourage innovation, planning participants in each of the cases examined attempted to develop plans and programs without applying financial constraint until late in the process. Pittsburgh developed its program based on a forecast of total available funding rather than identifying how much funding would be available for each transportation mode.

## CASE STUDIES

### Case Study A: Pittsburgh

#### *Background*

The Southwestern Pennsylvania Regional Planning Commission (SPRPC) is organized around a board and two key planning committees. Five commissioners from each of the six counties in the Pittsburgh area are represented on the board, as well as representatives from three Pennsylvania DOT (PennDOT) district offices and the PennDOT central office. The Transportation Technical Committee is responsible for drafting and recommending programs and plans to the board for final approval. In addition, the Transit Operators Committee represents transit interests and is responsible for drafting the transit-related aspects of the program/plan and making recommendations to the Transportation Technical Committee.

With a board consisting of 41 members, many of whom are elected officials, and the involvement of two committees that generally represent competing modal interests, Pittsburgh found that the process of removing projects from plans/programs was extremely politicized. To develop their financially constrained long-range plan, SPRPC board members, PennDOT officials, and staff had to undertake a long and difficult process of negotiation to eliminate \$6 billion from the plan. Ultimately, the plan contained a financially constrained list of projects, estimated at over \$10 billion, and an unconstrained list of projects totaling approximately \$4 billion.

In getting both agency planners and citizens to respond to the new priorities outlined in ISTEA, the SPRPC used three “hammers” to transform the approach to transportation plan-

ning and decisionmaking. These included the need for fiscally constrained plans, the need to meet air quality standards, and the need for greater public participation.

#### *SPRPC Did Not Classify Funding by Mode*

One of the stated guidelines for forecasting the availability of future levels of funding was that the “bottom line of available funding should not be classified as being ‘highway’ or ‘transit’ funding but be a measure of total funding available.” (21) This was an important ground rule because SPRPC wanted to get away from the “old business” of identifying funds as available for highway or transit purposes. SPRPC staff considered available funding as “transportation” funding so that they could be blind to the specific fiscal constraints placed on the various modes and initiate the long-range planning process with a goal of “building the best projects regardless of what they are.” According to a planner at the SPRPC, this guideline placed multimodal projects on more equal footing relative to the traditional highway programs. This approach resulted in an increased focus on transit and ultimately encouraged efforts to flex highway federal highway funds.

Despite SPRPC’s intent to be mode-blind, the resulting plan and related programs were, to some extent, directed by predetermined spending requirements when financial constraint was applied late in the planning process. For example, the region was required by PennDOT policy to spend at least 80 percent of its state transportation funds on maintenance-related projects. Because a large portion of the infrastructure in the Pittsburgh region is road-related, a large portion of the available funding is spent on maintaining the road infrastructure that is already in place.

#### *Greater Awareness of Need for Innovative Funding*

Financial constraint has underlined the need for private and innovative financing. Although multimodal planning in the Pittsburgh region is affected by the guidelines on how funds are spent on maintenance and new construction projects, the process also is subject to negotiation among the many interests represented. As one SPRPC official put it, it was “very difficult to make the transition from a long-range plan for politicians to a long-range plan for planners. In the end, we were forced to compromise.”

After financial constraint was introduced into the long-range planning process, the plan was reduced by \$6 billion. The current long-range plan has a section that identifies \$4.5 billion worth of “special” projects that do not have reasonably available sources of revenue. The plan indicates that for these projects to be implemented, significant funding will be required from private sources. SPRPC staff

indicated, however, that although the long-range plan is not entirely financially constrained, the identification of needed, but unfundable, “special” projects has “increased the focus on finding sources of innovative or private financing.”

### *Structure of Technical Committees May Affect Program Outcomes*

In developing the TIP and long-range plans, the Pittsburgh region has several committees that are responsible for making recommendations to the board for final approval. The Transportation Technical Committee reports directly to the board and is responsible for drafting the programs and plans. All transit-related aspects of the TIP and long-range plans are first developed by the Transit Operators Committee and then passed on to the technical committee for review and, ultimately, incorporated into the draft TIP.

Having a committee that specifically represents transit interests and a committee that represents all other interests has created an environment where the committees are sometimes at odds with each other. Although the technical committee represents all regional transportation interests, transit has its own committee and is considered separate. As a result, decisions are made based on a negotiating process that inherently places transit at odds with the other modes. Over the last 20 years, there has always been a high level of friction between these two committees.

## **Case Study B: Minnesota**

### *Background*

Over the past several years, Minnesota employed several measures to improve multimodal planning within the DOT. First, MnDOT reorganized to better integrate agency planning and programming efforts into modal centers as described in Chapter 2 to give nonhighway modes a stronger voice in the development of plans and programs. The department also created the ATPs to solicit the involvement of more diversified local transportation interests as described in Chapter 6.

Although MnDOT has focused on developing the capacity to integrate multimodal considerations into its overall statewide planning process, maintained a large staff to manage the transit and rail programs, and taken steps to use general fund revenues to finance multimodal projects, the level of multimodal activity is somewhat hampered by constitutional restrictions on the uses of state highway user tax revenues. Like the majority of other states, Minnesota’s state constitution prohibits gas tax revenues from being used for any purpose other than the maintenance or construction of highways and, as a result, there is no predictable or dedicated source of state revenue for nonhigh-

way or multimodal projects. This lack of predictable revenue for nonhighway projects makes implementation less certain. In attempting to address their state funding restrictions, Minnesota has taken advantage of their ability to “flex” federal funds from STP and CMAQ to nontraditional projects.

### *MnDOT Provides Regional Funding Targets for Planning Purposes*

In assisting ATPs in the development of financially constrained 3-year ATIPs, the state provides each ATP with a regional funding target that does not distinguish between funds that must be used for certain modes (22). Although the state provides the ATPs with state and federal funding projections, only the federal funds are subject to the ATP project prioritization process. These targets are aggregate estimates of the total federal and state funding that is likely to be available over the next three years. MnDOT does not identify subtargets for specific funding categories because historical spending levels for the various modes do not accurately predict future levels, and a lack of priorities with regard to multimodal spending prevents making reasonable funding projections (22).

Without subtargets or specific information on funding available for certain modes, the primary role of the ATP is to incorporate the transportation recommendations of the RDCs, MPOs, other local governments, and MnDOT into the ATIP, which is an integrated list of transportation investments. Once the ATIPs have been prepared, MnDOT includes them in the STIP (22).

In helping the MPOs develop financially constrained long-range plans, MnDOT advises MPOs to recognize that “the existing level of funds available for the STIP is the best approximation of the funds available for the MPO long-range transportation plans.” As a result, the MPOs look to the STIP for both short- and long-term estimates of future levels of federal and state funding, and they use these estimates as the basis for their long-range plans.

Minnesota’s use of targets provides the ATPs with an unrestricted short-range planning tool that offers some assistance in determining the funding available for use within the region. The targets provide a starting point that allows planners to establish a priority list of projects to be included in the ATIP and STIP. The ATIPs, the STIP, and the regional long-range plans are all a function of these estimates of available funding.

Given the use of targets to “prime the planning process” from the beginning and the restrictions that have been placed on the uses of state funding, ATPs are to some extent constrained by these limitations and, ultimately, MnDOT staff agree that ATPs may not have much flexibility in terms of programming multimodal projects because the necessary funds are either unavailable or their uses are restricted.

### *Lack of Funding Discourages Multimodal Project Implementation*

As discussed in Chapter 2, Minnesota has taken steps to reorganize its planning and programming process, to strengthen multimodal planning consideration in the central office, and to begin building multimodal capabilities in district offices. MnDOT has also involved local stakeholders through its ATPs as discussed in Chapter 6. These efforts appear to have expanded multimodal planning and programming consideration. However, state funding support for multimodal projects does not appear to have kept pace with these changes.

In addition to Minnesota, many other states share the same difficulty when it comes to funding multimodal projects. For example, revenues from a state highway user tax often may be legislatively restricted to funding only highway-related projects. Predictable revenue for other types of projects is often lacking. Transit, railroad, and waterway projects are financed with state general fund revenues, which are less reliable and more vulnerable to budget cuts. As a result, and to the disappointment of some within MnDOT, the effort to support and conduct multimodal planning activities has not resulted in multimodal projects, and some staff view this as discouraging the planning process.

### **Case Study C: Wisconsin**

#### *Background*

In November 1994, Wisconsin formally adopted its first statewide long-range plan under the guidelines of ISTEA. Two aspects of the plan are especially important. First, the plan went through a very extensive public participation process that involved thousands of citizens (8). Second, the state's long-range plan was financially constrained even though ISTEA requires that only the STIP be financially constrained.

Another important issue with regard to transportation planning in Wisconsin relates to how projects are financed. In 1977, Wisconsin established a Comprehensive Transportation Fund that relies heavily on motor fuel tax revenues to construct, maintain, and improve all modes, including highways, local roads, transit, rail, airports, harbors, and bikeways.

Unlike states such as Minnesota, who use their general funds to finance nonhighway transportation capital, Wisconsin does not finance transportation without general funds. In addition, both highway and nonhighway transportation projects are funded by the relatively more predictable revenues that go into the Comprehensive Transportation Fund. Relative to other states, Wisconsin places fewer restrictions on how these funds may be spent. This theoretically gives the DOT more flexibility in terms of funding multimodal projects.

### *Public Involvement Process Informs Financial Constraint*

There were three stages to Wisconsin's public involvement process. In the first stage, Wisconsin DOT (WisDOT) conducted a series of listening sessions that were focused on identifying transportation concerns and collecting information on how transportation relates to issues such as the environment and the state economy. In the second stage, WisDOT used the information collected during the first stage to develop four detailed long-range alternatives and then initiated an active and intense effort to present the alternative plans to the public and to solicit their comments on the alternatives. In the third stage, WisDOT used the comments provided during stage two to propose a long-term plan and again presented the plan and solicited comments from the public.

Wisconsin's effort to solicit comments from the public went beyond simply identifying potential long-term policies. During their second and third stages of the process, they explained what each of the proposed policies would cost. The public involvement process, which allowed citizens to consider a range of policy options and think about their willingness to pay for each of these options, has been important and useful in a number of ways. The plan, which calls for an additional \$8 billion over 25 years, would have been considered unreasonable given recent efforts in the state legislature to reduce the overall size and role of state government. However, the \$8 billion increase, which was the result of such an extensive public involvement process, has strong credibility. Legislators, WisDOT officials, mayors, and citizens often refer to the plan to support an argument for a particular project or an increase in transportation funding.

Many agencies find it difficult to forecast reasonable sources of new funding without information on what the users are willing to pay. The WisDOT public involvement process has provided information on what citizens want and what they will pay. Having this information and a financially constrained long-term term plan have answered a number of important questions and focused the ongoing debate on the relationship between transportation policy and finance.

#### *State Revenues Directed by Policy*

WisDOT administers a flexible state transportation fund that is policy driven rather than formula driven. According to one interview with a senior WisDOT official, the consolidated Transportation Fund was created in an effort to move closer to a policy-driven transportation budget. Relative to the financing structures used in most other states, the fund gives WisDOT more flexibility in terms of implementing new or innovative new transportation policies. Without this flexibility, WisDOT would be experiencing the same difficulties MnDOT has encountered with regard to accommodating the changing requirements of the multimodal trans-

portation system. Relative to Minnesota, where there is a clear distinction between funds that are legally available for highway and nonhighway projects, Wisconsin and other states, such as Maryland and Delaware, are far less restrictive in their ability to use funds for different purposes and, as a result, they tend to be more enthusiastic with regard to multimodal planning and project development.

The state is fortunate in that it has an unrestricted and dedicated source of transportation funding that allows WisDOT to implement the policies developed as part of the statewide public participation/planning process. Relative to the majority of states where the uses of state funding are restricted, the priorities identified during the planning process in Wisconsin appear to be more easily implemented during the regular appropriations process. WisDOT is more constrained by the state legislature's spending priorities.

#### *Plan Not Restricted by Modal Funding*

During the development of the long-range plan, Wisconsin assumed that anything could be financed. The three-stage public involvement process was careful in how it forced citizens to think about what they were willing to pay. WisDOT staff believed that having encouraged residents to think about financial issues early on could have taken away from efforts to examine the range of possible transportation policies and alternatives. In stage one, WisDOT officials listened only to what residents wanted without making them come to terms with the financial realities. In stage two, WisDOT officials provided information on the sources of funding for the various alternatives. It was not until the final stage that WisDOT provided more specific information on the amount of funding that could be expected. In the final stage, WisDOT showed how much each alternative would cost in total and how much it would cost each resident of Wisconsin. Only then were residents required to think about the financial issues. Wisconsin benefited from this approach because it focused the debate on identifying plans and policies to meet identified needs and goals.

The Wisconsin planning process benefited, in part, from having the flexibility to obtain funding for well justified multimodal projects and policies. The lack of funding limitations allowed WisDOT to encourage unrestricted statewide planning in the public involvement process. To some extent, having the opportunity to finance multimodal projects con-

tributed to the high levels of public involvement because residents knew that funding was not an automatic barrier to new, innovative, and/or multimodal projects.

## LESSONS LEARNED

In summary, the three case studies in this chapter illustrate that financial constraint has changed the way in which MPOs and state DOTs approach planning and focused attention on a need for funding programs that can accommodate multimodal alternatives. More specifically, there are four other lessons learned from this research.

**Financial constraint forces decisionmakers to consider investment decisions more carefully.** Financial constraint requires a realistic assessment of the availability of funding and, as a result, more debate and consideration are given to the wide range of affordable transportation alternatives. Planners have to reevaluate how they prioritize projects, politicians have to find other ways to represent the interests of constituents, and the public, ultimately, has to decide whether or not they are willing to pay for the projects that remain on the list.

**Financial constraint has increased the pressure to identify sources of funding that are not restricted to any one mode.** Having financing programs at both the federal and state levels that allow funds to be spent across modes ensures that planning processes that identify useful multimodal opportunities can be supported. Without existing or identifiable funding sources, these opportunities cannot be included in a program or plan.

**Financial constraint limitations should be imposed late in the planning process.** When financial constraint is applied late in the planning process, plans are developed without regard for the restrictions that apply the various transportation modes. As a result, the planning process can better explore alternatives to meeting transportation needs regardless of mode. Ultimately, though, a test of financial feasibility must be applied.

**Financial constraint encourages efforts to identify innovative or private sources of funding.** The financial constraint provisions have focused more attention on the lack of funding for nonhighway projects. Increased efforts to fund these projects promote the use of innovative or alternative funding approaches.

## CHAPTER 8

# SUMMARY AND CONCLUSIONS

In this report, the research team has reviewed the development of innovative multimodal planning techniques in five state DOTs and MPOs throughout the country. The first section of this chapter summarizes some of the major conclusions and observations made in this project. The chapter then presents a summary of the major themes brought up by participants in the project and concludes with recommendations for additional research based on the themes revealed in all aspects of the project.

### CONCLUSIONS FROM CHAPTER 1

Chapter 1 described the major policy direction taken in the project as a result of the phase one work program, which included a nationwide review of activities underway in multimodal and intermodal planning. At the commencement of the project, there was an expectation by the research team that many of the research results on the subject of multimodal planning would concern methods and procedures for the programming of capital budgets. What emerged from the phase one research effort was something considerably different. On examining the practices discussed around the country, it was revealed that fewer than 5 percent of the documents identified were concerned with programming and evaluation. The overwhelming majority of documents identified concerned the application of innovative planning procedures in an effort to deal with a particular policy problem, such as air quality, management strategies, growth management, and economic development. The decision to explore the breadth of application of these innovative methods led to the work plan's emphasis on many separate case studies.

### CONCLUSIONS FROM CHAPTER 2

Chapter 2 described the major organizational/structural changes that are underway in state DOTs and MPOs to foster effective multimodal planning and programming processes. This assessment first looked at the key factors underlying DOT and MPO change. The research team concludes that there are various change agents at the state and local level promoting new directions in transportation policy. These change agents included state legislatures and governors, state-appointed transportation commissions (function-

ing as a policy board), DOT leadership, large and well established regional planning organizations, and local and special interest groups. In the cases evaluated, the passage of ISTEA and the CAAA were viewed as very supportive of organizational and cultural changes in the agency; but in all cases, there were important change agents at the state and/or local level.

Four overall themes emerged in observations of organizational change to promote multimodal planning and programming. First, the DOTs studied have attempted to address the special needs of large urban centers through structured partnerships with MPOs. In Minnesota and Washington State, these partnerships appear to have improved the transportation planning and programming process.

Second, in each of the cases studies, the development of modal expertise and advocacy in the DOT appears to be an important step early in the creation of an effective multimodal planning and programming process. Agencies naturally tend to promote solutions in which they have expertise. In Washington State, the intercity rail program was substantially bolstered by developing a core staff with expertise in passenger rail.

Third, in DOTs that are decentralizing planning and programming to the district or regional offices, changing the culture and processes of these offices is important. Agencies that involve the district offices early and throughout the organizational and program restructuring process with the central office, as in the case of Colorado, stand the best chance of fostering lasting change throughout the organization.

Fourth, the flexibility of transportation program funding appears to be an important factor in promoting multimodal planning and programming. Agencies with flexible transportation trust funds have the fewest constraints to multimodal planning and programming efforts and in implementing the outcomes. This, in turn, stimulates interest in considering multimodal issues and solutions as part of the planning process. However, DOTs that lack such legislative funding flexibility have still found other means of supporting their multimodal planning and programming efforts.

### CONCLUSIONS FROM CHAPTER 3

From the examination of the case studies in Chapter 3, four major conclusions can be drawn. First, multimodal planning

tools can best be characterized as an essential element of a process that considers the best interests of the moving person or goods and considers the possible role of various modes as a means toward that end. The “outcome” of this process might be an investment entirely in highways (in rural Washington) or largely in nonhighway projects (in urban Portland). The role of the set of tools is to provide robust power in the analysis of need, not to predetermine the modal nature of the plan that results from the process. When multimodal planning is seen as the imposition of one set of modal preferences over another, it is often resisted.

Second, Chapter 3 concluded that multimodal planning is best carried out when, in the words of the Wisconsin plan, “all modes are analyzed simultaneously and interactions among the modes are specifically accounted for.” This process, as exemplified by the studies of possible freight modal diversion of truck movements in Wisconsin and barge movements in eastern Washington State, examines the impact of variations in assumptions about one mode on the resulting operations of a second mode and stands in stark contrast to the predominant pattern of preparing modal plans separately for integration at the time of the capital budgeting process.

Third, the case studies in Chapter 3 show that multimodal planning practices are most needed when applied to planning that is driven by policy needs, rather than the analysis of facilities. When the *efficiency* of the facility as seen by the facility owner or manager is being examined, single modal measures are highly appropriate and often used. However, when it is the *effectiveness* of the system in terms of bringing about an end state desired by public policy, modally oriented descriptions of the facilities often fail to translate back into terms usable by the policymakers in accomplishing their objectives.

Finally, the utilization of the data categories and terms accepted by other sectors of the society (e.g., terms used in economic or environmental analysis) can bring about efficiencies in both the collection of the base data and in the usefulness of the results. The most productive and useful planning exercises were organized in terms of the needs and characteristics of the person or goods being transported, rather than in terms of the use of facilities under examination. In terms of freight, analyses based directly on the known characteristic of the commodity (defined by 4-digit SIC code) were far more robust in their explanatory power than were analyses based on zonal averages or generalized characteristics of land use.

## CONCLUSIONS FROM CHAPTER 4

In Chapter 4, several conclusions were drawn concerning the status of the present application of, and further direction for, the integration of performance measurement into the transportation planning process. First, the chapter reaffirmed

the critical importance of carefully choosing the measure of performance, in terms of its ability to educate, inform, and support the actual decisions being made. In Florida, the use of the V/C ratio (LOS) to predict the desirability of urban growth patterns was concluded by policymakers to have been the wrong measure, which produced counterproductive results. This initial single measure was replaced by a process of locally based and locally defined measurements. Similarly, in other areas of the country, measures are being selected to serve locally defined policy questions. In Minnesota, the IMS is measuring the perceptions of safety at the local bus stop. This measure examines a locally defined priority and attempts to apply a metric of evaluation to that specific issue. At the same time, practitioners in the area of intermodal management are adopting measures of performance made at a local, primary level and rejecting measures that apply systemwide averages and summary indices. Measures such as “statewide average cost per ton” are being rejected in favor of “do trucks have difficulty getting around corners to get into this facility?” The project noted a trend toward the use of direct and primary observations on the basis of terms that are readily understandable and usable within the local political process.

Second, Chapter 4 noted that the need for truly multimodal measures of performance will increase in importance as the policy questions become more complex. The rote application of V/C ratios to evaluate the performance of transportation is an appropriate response to policy concerns about the quality of traffic flow over a given link. For example, in the determination of the appropriateness of land use patterns in Orlando, this initial measure of performance has been replaced by a process of measurement and policy review that is truly multimodal in nature.

Finally, Chapter 4 concluded that there is a significant difference of opinion within the profession about what is even meant by the concept of performance measurement in transportation. In some of the literature reviewed, the concept is about quantitative measures of output created by the agency; in still others it is about management efficiency. In some states it refers to “benchmarks” describing idealized and perhaps unrealistic standards in which the professional practitioners have little belief. In others, it is a commitment to collecting great amounts of data in terms only valuable to, and only understandable by, the managers of specific facilities and systems of facilities. Implicit in this observation is the idea that further research should be undertaken simply to better establish the ground rules in this new area of planning.

## CONCLUSIONS FROM CHAPTER 5

In Chapter 5, the critical concern was the issue of public involvement as a tool of multimodal planning. Through the three highly innovative examples described in this chapter, as well as in examples cited in Chapters 6 and 7, this issue is

explored and documented. The cases included here demonstrate that effective participation programs have encouraged multimodal consideration in plans and programs as well as implementation of plans and programs. The voter referendum in Maine, while unique, is a clear example of a phenomenon observed across the country: policy issues being raised and defined by forces outside the traditional planning community. In St. Louis, the successful effort to bring new players to the planning process has produced a very different type of plan than previously adopted, one that incorporates detailed multimodal strategies for addressing newly defined transportation needs, rather than simply documenting capital needs.

Although these examples provide intriguing results for the planning process, the research team is not convinced that all public participation efforts will foster multimodal planning processes as defined in Chapter 1. There is some evidence that the result may just be more advocacy for adding projects of a particular mode, rather than cross-modal evaluation as part of the search for the best means of meeting the needs of the person or thing to be transported. However, public participation can be a highly effective tool in better understanding the needs of users or potential users of transportation, and in that context, it is a very important contribution to the multimodal planning process.

The cases described in this chapter illustrate certain important lessons for the practitioner to help structure an effective participation process: (1) early involvement of the public is important to the credibility of the process and to effective identification of needs; (2) public involvement at the implementation stage adds to the credibility and helps ensure that defined needs are met; and (3) use of several different methods and venues for engaging the public increases the chance of involving the typically “uninvolved.”

In addition to these themes, the remarkable example of participatory planning in St. Louis illustrates the advantage multidisciplinary agencies may offer to link transportation to other community issues and to involve users and potential users in system planning.

## CONCLUSIONS FROM CHAPTER 6

In Chapter 6, several observations were made concerning key factors to consider in developing statewide planning processes, generally, and in involving rural interests and issues in those activities, specifically. Although certain analytical issues surfaced in the review of the three examples cited, these cases demonstrate that sometimes process issues are more important in ensuring a representative and credible plan than technical concerns.

In part, this conclusion is because each of the cases examined involved a new effort on the part of the state or the local/regional agencies involved. These first plans and/or programs were developed at the same time as players were

getting to know each other and learn about common, and not so common, interests. In only one case, Vermont, were the regional planning boundaries already established and the regional planning agencies somewhat experienced with transportation issues. But even in this instance, new individuals were recruited to serve on newly formed transportation committees. It is reasonable to surmise, then, that these process issues, if handled satisfactorily during the initial stages of the process, will recede in importance when these organizations develop their next plan or program. Thus, issues such as data availability and multimodal analytical techniques, which were identified also in this first round of plans and programs, will take on much greater importance as the process continues.

Through these cases, the research team learned that early involvement of local elected officials is a necessary ingredient in establishing credibility for the process. This was stressed in these states and in several others where interviews were conducted. In one state, where controversy over the locally based process has posed numerous problems, state DOT officials pointed to the lack of local official involvement as a fatal flaw. But rural officials seem to be even more affected by the need to serve in many capacities than urban officials because there are usually fewer local officials, elected and appointed, to serve on boards and commissions. This point is important when considering consultation processes in rural areas: multiple planning organizations pose a special burden because of the demands on local officials’ time.

The research also indicates that regional planning organizations in rural areas want clear policy guidance, multimodal information, and access to technical expertise. From the cases described in this chapter, it appears that the availability of nonhighway data is a common problem for rural planning and may impede consideration of multimodal solutions simply because of lack of information with which to define and compare alternatives.

Finally, the research team found a strong perception that putting rural and urban interests together in any process that involves allocating resources is perceived to place rural interests in jeopardy. In Colorado, this concern was effectively dealt with both by allowing local interests to define their own regional planning boundaries and by establishing an umbrella committee, involving each planning region, to advise the state on how to incorporate regional plans and programs into the state’s plan and improvement program. In other ways, these cases demonstrate that early and open consultation with local officials helps avoid this concern.

## CONCLUSIONS FROM CHAPTER 7

Chapter 7 examined financial constraint and its impact on planning. In all cases, it was found that financial constraint: (1) changed the way in which MPOs and state DOTs



approach planning, and (2) has produced a need for funding programs that can accommodate multimodal alternatives. More specifically, these cases illustrate new realities of the planning process.

Financial constraint requires decisionmakers to consider investment decisions more carefully. It requires a realistic assessment of the availability of funding, and as a result, more debate and consideration is given to the wide range of affordable transportation alternatives.

Financial constraint increases the demand for funds that are not restricted to any one mode. Having financing programs at both the federal and state levels that allows funds to be spent among modes without restriction ensures that planning processes that identify useful multimodal opportunities can be supported. Without identifiable funding sources, these opportunities cannot be included in a program or plan.

Financial constraint that is applied to planning late in the process results in plans that are developed without regard for modal biases that may exist within funding programs. As a result, the planning process is better able to explore alternatives to meeting transportation needs regardless of the modal restrictions on funding. Ultimately, the federal requirement for constraint must be applied to MPO plans, and this has highlighted funding difficulties that exist for particular modes and projects. This focus on identifying sources of funding encourages alternative or innovative funding approaches.

#### **ISSUES RAISED IN THE INTERVIEW PROCESS: ALTERNATIVE FUTURES FOR MULTIMODAL PLANNING**

Interviews in most of the case studies included a discussion about the future of multimodal planning. In response to open-ended queries about the general future of multimodal planning, several participants expressed concern about one possible trend in the push toward multimodal planning. There is a belief that the modal specialist (an expert in highways, in rail service, or in airport management) will need to be replaced by professionals who are free of modal "bias." In this view, a multimodal orientation requires the diminution of the role of the modal expert in the planning process, and supplants it with a new professional, those trained in an as-yet-undefined cross-modal procedure. Similarly, several expressed a concern that a "multimodal" orientation requires the application of common evaluative measures to be applied across modes. In this model, the capital programming process is undertaken with "modally blind" indices, which allow the value-free comparison of the role of alternative investments. For participants worried about this trend, there was healthy skepticism about just how far the concept of multimodal orientation should be extended. Importantly, the interviews with state DOT and MPO managers did not support this view of the future of multimodal-

ism. Although several attempts to create cross-modal evaluative measures were observed, primarily from the academic and consulting sectors, virtually all of those interviewed were decidedly opposed to trying to establish mode-neutral units of measurement.

In several states, an alternative view of the future of multimodalism is developing. This pragmatic view of multimodalism builds on existing institutions and institutional memories. What emerges is the importance of modal specialists to be the expert interpreters of their own mode. This cannot, will not, and should not go away. In one state, which has succeeded in developing a statewide emphasis on multimodal planning, the research team asked the top decisionmakers about their proudest achievement in encouraging a spirit of multimodal and intermodal planning. The two senior officials in the state replied that they had encouraged individual modal specialists within the state DOT *to become advocates for their particular modal solution* and that the interaction between the separate individuals was resulting in better decisions for the organization. This answer is significant. These decisionmakers did not say that they were re-educating each staff member to think beyond the terms of their own mode, or that each key staff member was asked to incorporate multiple modal orientations. Rather, they were encouraged to argue for the application of the modes they understood the best; and *from that diversity, the agency as a whole, gained the broader perspective*. In this particular state, knowledgeable managers and decisionmakers are able to effectively access the modal information being presented and make the necessary decisions.

#### **CANDIDATES FOR FURTHER RESEARCH IN MULTIMODAL PLANNING**

Many of those participating in this project are looking to refine the tools of analysis to improve the quality of mode-specific data used in the multimodal task of policy formation and capital programming. The results of the research suggest a strong perceived need to craft modally specific information in a manner that will be of the most value to those with multimodal responsibilities such as the capital programmer or the policymaker. This is a significantly different concept from the idea that modal information has to be *replaced* by non-mode-specific multimodal information. In general, the interviews have not revealed any desire by working practitioners to replace indices on the basis of mode-specific information with generic "multimodal" summary indices. Rather, participants have discussed a desire to see more research effort placed on the refinement of mode-specific data so that it can better serve the task of evaluation between and among largely different kinds of candidate transportation investments.

In a similar vein, several participants expressed a concern about the emphasis in professional research about the use of

planning techniques designed, in effect, to substitute one mode for another. In their view, the purpose of a high-speed rail line is not to obviate the need for a highway or even to relieve congestion on that highway; the purpose of a high-speed rail line is to provide mobility for the users. Several planners felt that the federal regulations focused too much on the idea of one mode substituting for another mode. In fact, these participants suggested that an investment in rail can contribute to the mobility of the persons or goods carried and may be the best investment decision, whether or not it can be shown to obviate the need for additional capacity on the parallel highway. In these cases, the multimodal planner is attempting to determine the optimal contribution that can be made by each mode toward the end defined by the established public policy.

In rural planning, the lack of transportation data for systems other than the state highway system is a continuing barrier to multimodal planning. Participants pointed specifically to the lack of data on freight movements, including shipper characteristics. The provision of simplified data collection methods for rural districts for all modes would help advance the development of multimodal transportation planning in these areas. The capital investment planner needs tools of evaluation that accurately describe the impacts of the investment of a new rail spur to the coal yards *and* the impacts of the investment in a longer

runway for the cargo plane. Generally, the capital budgeting planner is asking for better methods to describe the impacts of the two separate candidate investments in a manner that can support the political decision-making process. These interviewees were less interested in supporting research that selects between the modal solutions and more interested in supporting research that refines the understanding of just how the modes work together to solve a given policy concern.

Finally, the project research has revealed a strong interest in helping planners to deal with a key step in the ISTEA planning process—the selection of performance measures keyed to the actual policy decision under examination. There is significant confusion, and even misunderstanding, about this critical step of the process. When the multimodal planning process, as envisioned in ISTEA, serves to support decisions that are locally desired and locally held to be important, the process supports a great diversity of values. When applied mechanically with an implicit reliance on expensive and cumbersome data collection, this same process has been interpreted to imply the imposition of a uniform policy orientation over the separate states and regions. This report concludes with the observation that more research attention should be paid to the task of helping practitioners deal with the creation of performance measures that support locally defined issues and policy concerns.

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## APPENDIX

### LIST OF INTERVIEWEES

Addante, Evelyn, Massachusetts Port Authority  
 Beaulieu, Peter, Freight Mobility Manager, Puget Sound Regional Council  
 Bender, Bruce, Director Regional Planning, Vermont Agency of Transportation  
 Blair, Annette, ATP Member, Minnesota  
 Bloom, Jon, ISTEPA Program Coordinator, Minnesota DOT  
 Boothe, John, Rural Planning, Chittenden County Regional Planning Commission  
 Bourdon, Dan, Two Rivers Regional Planning Commission  
 Bowman, Clair, Ada Planning Association, Boise, Idaho  
 Brant, Emil, Metropolitan Planning Organization Executive Director, Metropolitan Council  
 Briscoe, Kathryn, MPO Manager/Coordinator Outstate Urban Area, Minnesota DOT  
 Campbell, Brian, Port of Portland  
 Carr, Melanie, Florida Department of Transportation  
 Coe, Jack, FHWA, Idaho District  
 Cohoon, Edwin, Deputy Commissioner and Chief Financial Officer, Minnesota DOT  
 Cole, Terry, Thurston Metropolitan Planning Organization  
 Connery, Nancy, Adviser to Maine Department of Transportation  
 Cotugno, Andrew, Director, Portland Metro  
 Cushman, King, Director of Transportation Programs, Puget Sound Regional Council  
 Dalton, Doug, Wisconsin Department of Transportation  
 Dierdorff, Raymond, Planning Director, Washington State Ferries, Washington DOT  
 DiPietro, Chuck, Long Range Planning, Southwestern Regional Planning Commission  
 Ellison, Judith, Acting Director, Transit Division, Minnesota DOT  
 Emery, Laurie, Planner, Montpelier Regional Planning Commission  
 Erickson, Jean, Director, Colorado Transit Association  
 Favour, Thomas, Exec. Director, Dane County Regional Planning Commission, Wisconsin  
 Forlow, Blair, East-West Gateway Coordinating Council, St. Louis  
 Hain, Randy, Programming Manager, Washington DOT  
 Hammond, Bruce, Natural Resources Council of Maine  
 Hamus, Tony, ATP Chairman District #6, Minnesota  
 Harvey, Stephen, Executive Director, Kelso Metropolitan Planning Organization  
 Havorson, Randy, Asst. Director, Research & Investment Management, Minnesota DOT  
 Hocker, Ed, Transportation Planner, Colorado Department of Transportation  
 Hoglund, Mike, Transportation Planning Manager, Portland Metro  
 Howard, Charles, Transportation Planning Office Manager, Washington DOT  
 Howard, Tom, Wisconsin Department of Transportation  
 Johnson, Keith, TIP Development, Southwestern Regional Planning Commission  
 Kale, Steve, Planner, Oregon Department of Transportation  
 Kirch, Lawrence, Director of City Planning, City of La Crosse, Wisconsin  
 Kirst, Paul, Director, Office of Strategic Initiatives, Minnesota DOT  
 Kreideweis, Jonette, Acting Director, Intermodal Policy Section, Minnesota DOT  
 Kush, Don, West Central Wisconsin Regional Planning Commission, Eau Claire, Wisconsin  
 Lahsene, Suzie, Port of Portland  
 Lee, W. David, Transportation Planner, Florida Department of Transportation  
 Lenzi, Jerry, Washington State Department of Transportation  
 Llorca, Ysella, State Transportation Planner, Florida Department of Transportation  
 McBride, Scott, Planning & Programming Office, Metro Division, Minnesota DOT  
 McCloud, Doug, Florida Department of Transportation  
 McCumber, Mary, Executive Director, Puget Sound Regional Council  
 McDonald, Jim, Director of Finance, Wisconsin DOT  
 Mierzejewski, Edward, Project Manager, Center for Urban Transportation Research  
 Minor, Paul, Director of Planning, Maine DOT  
 Morrison, Sid, Secretary of Transportation, Washington DOT  
 Nelson, Donald, Deputy Director, Office of Urban Mobility, Washington DOT  
 O'Neal, Michael, Philips Neighborhood Center, Minneapolis, Minnesota  
 Ohm, Carl, Transportation Planning Director, Metropolitan Council  
 Olen, Irv, ADA Planning Association  
 Paolami, Milae, Finance Department, Wisconsin DOT  
 Pedersen, Neil, Director, Office of Planning and Preliminary Engineering, Maryland DOT  
 Polzen, Steve, Center for Urban Transportation Research  
 Putnam, Patrice, RTAC Supervisor, Maine DOT

Pyers, Clyde E., Director, Office of Highway Policy Assessment, Maryland DOT  
 Rahimi, Maurice, Pikes Peak Area Council of Governments, Colorado  
 Reiter, Charlie, Rochester-Olmstead Council of Governments, Minnesota  
 Ricard, Diane, Massachusetts Port Authority (Cambridge Systematics)  
 Rickman, Toby, District Planning Director, Olympic Region Office, Washington DOT  
 Rought, Raymond, Director, Office of Aeronautics, Minnesota DOT  
 Ruble, Dave, Colorado Department of Transportation  
 Rude, Dan, Deputy Director, Washington State Transportation Improvement Board  
 Scheck, Ronald, Center for Urban Transportation Research  
 Schenckelberg, Al, Director, Office of Investment Management, Minnesota DOT  
 Scherer, Philip, Executive Director, Transportation Development Association, Wisconsin  
 Schrantz, Roger, Administrator, Wisconsin DOT  
 Selness, Cecil, Director, Office of Railroads and Waterways  
 Squires, Jeff, Director Planning, Vermont Agency of Transportation  
 St. Clair, Bob, Wisconsin Department of Transportation

Stasiak, Richard, Center for Urban Transportation Research  
 Stermann, Les, Executive Director East-West Gateway Council  
 Stringfellow, Bill, Transportation Planning Business Group Manager, Colorado DOT  
 Tanzer, Fred, Inter-Agency Director, Metro Division, Minnesota DOT  
 Thelke, Linda, Public Participation Coordinator, Wisconsin DOT  
 Thompson, Robert, Chief Financial Officer, Metropolitan Transit Corporation (MTC)  
 Toohey, James, Assistant Secretary, Washington State Department of Transportation  
 Truckenbrod, David, City Planner, City of La Crosse, Wisconsin  
 Upham, Jim, Executive Director, Kittery MPO  
 Wade, Randall, Wisconsin Department of Transportation  
 White, Gretchan, Director of Policy, Washington DOT  
 Williams, David, Oregon Department of Transportation  
 Woodwell, Davitt, Technical Committee Member, Pittsburgh  
 Young, Sandi, Director, Middleburg Regional Planning Commission, Vermont  
 Younger, Kristina, Senior Planner, Capitol District Planning Commission, Albany, New York

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